FLIGHT and AIRCRAFT ENGINEER

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FIRST AERONAUTICAL WEEKLY IN THE WORLD : FOUNDED 1909

Editorial, Advertising and Publishing Offices: DORSET HOUSE, STAMFORD STREET, LONDON, S.E.1
Telegrams : Flightpres, Sedist, London. Telephone : Waterloo 3333 (60 lines.)

COVENTRY : 8 - 10, CORPORATION ST. Telegrams : Autocar, Coventry. Telephone : Coventry 5210.
BIRMINGHAM, 2 : KING EDWARD HOUSE, NEW STREET. Telegrams : Autopress, Birmingham. Telephone : Midland 7191 (7 lines).
MANCHESTER, 3 : 260, DEANSGATE. Telegrams : Iliffe, Manchester. Telephone : Blackfriars 4412.
GLASGOW, C.2 : 26B, RENFIELD ST. Telegrams : Iliffe, Glasgow. Telephone : Central 4857

SUBSCRIPTION RATES : Home and Abroad : Year, £3 1 0. 6 months, £1 10 6.

Registered at the G.P.O. as a Newspaper

No. 2031. Vol. LII. November 27th, 1947 Thursdays, One Shilling

The Outlook

International Air Transport

WHEN it was decided that civil aviation was of sufficient importance in the affairs of the nation to merit the establishment of a separate Ministry, the post of Director-General became redundant and the holder of it, Sir William Hildred subsequently became Director-General of the International Air Traffic Association. This country's loss has proved the world's gain, for in his new capacity Sir William has a much wider field, and he has already become an international figure of high standing.

In his annual report to the third general meeting of I.A.T.A. at Rio recently, where a vast amount of work was done, and at which very good agreement was achieved on many important aspects, Sir William pleaded for the airlines to take the public more into their confidence. It was not, therefore, surprising that when he addressed, on November 20th, the National Aviation Clinic at Springfield, Illinois, U.S.A., he should draw a realistic picture of the present position of international air transport.

Sir William stated quite frankly that no form of transport has been so over-sold as international air transport, but he thought that when the drive was first promoted it served a good and useful purpose. Public interest has now been channelled into the topic of air safety, and Sir William delivered one of his epigrams by saying that "There is no single safety problem. Running an airline is a matter of fanatical attention to a multitude of small details." The truth of that is obvious to operators, but not generally appreciated.

Impatience with the slow progress that is, apparently, being made is very natural, but criticisms often fail to take into account the vast number of interests concerned. For example, in connection with airports the international air transport network is based upon something like 200 Government jurisdictions, either national, mandated, insular or colonial. In the case of landing aids, Sir William pointed out that the choice was extremely important since so much money would be involved that it would determine the course of development for years to come. And it had to be universal, as aircraft could not possibly carry a separate set of electronic devices for every country.

When commenting on the I.L.S. and G.C.A. systems, Sir William made the interesting statement that airlines have a general preference for the former as a primary aid and the latter as a supplementary one. G.C.A. (Ground-Controlled Approach) is a talk-down system. That is adequate within any one country, but as Sir William said, "We must think of the Venezuelan pilot landing in China. If we are to depend upon anything, therefore, it must be upon instruments which have no language barrier and which are not dependent upon the spoken word." In that statement there may be a pointer to future development. The view is shared by a contributor in this issue, who also fears the language difficulty. We rather feel that this fear is exaggerated. The difficulty does exist, but the vocabulary needed is not extensive and should not be beyond the capacity of aircrews to learn in several languages.

Realism

"NEITHER the American nor the British aviation industry is yet in a position to lay down a basic design for a commercial plane to utilize jet power and say, 'This is it—now put it to work on the airlines.'" This very realistic view is expressed by Mr. W. E. Beall, vice-president for engineering of the Boeing Aircraft Company, in the Boeing Magazine. The article in question gives several reasons why regular commercial travel in jet-powered air transports is not likely to materialize for ten years or so. There are many aerodynamic and structural airframe problems to be solved, and the jet engine itself suffers, again to quote Mr. Beall, from lack of reliability, brevity of service

life, limited take-off power, high fuel consumption, and tremendously high cost of the individual jet engine.

The distinguished American engineer compares the state of development of the jet engine of to-day with that of the piston engine shortly after the first World War, and thinks it should be possible to cover in about fifteen years the ground that has taken thirty years to cover in the case of the piston engine. He predicts that a few operational commercial aircraft will be in the air in about five years, but thinks it would be a highly impracticable gamble to begin actual quantity production now. British designers will agree with that view.

On the subject of American and British development policies Mr. Beall has some interesting things to say. After explaining that the war and American competition have forced British manufacturers "to abandon to-day in favour of to-morrow," and that we are attempting to take in one long leap the distance which American aviation is setting out to cover in a series of short steps, he concludes: "I believe the British are entirely right in putting their faith in the eventual ascendency of the jet-engine. We in America, however, are moving towards this 'jet future' without sacrificing the present. When the proper stage of development has been reached, the jet will most certainly replace the reciprocating engine. But it will take time."

Few who appreciate the position would quarrel with these views. In the meantime it is satisfactory that the first of the British long-term projects, the A.W.52, has flown very successfully. It incorporates nearly every feature that is foreseen for aircraft of the future.

Gain and Loss

THESE are troublesome times. The British aircraft industry is facing economic as well as technical problems. The news that Cunliffe-Owen have decided not to proceed with production of the Concordia means that a very promising type of aircraft disappears. The mishap to the Airspeed Ambassador will interrupt, for a time, the further testing of this remarkable machine. Enough was already known of its characteristics, however, for a decision concerning production to be reached on other grounds.

Reduction of the Vickers Viking order from 50 to 35 as a result of the economic crisis is a loss to the country so far as our own air routes are concerned, but the type is suitable for other operators.

The threat of liquidation hanging over Miles Aircraft is one of the most regrettable aspects of the times. Ever since Mr. G. H. Miles joined Philip and Powis there has been a stream of interesting types coming out of the Woodley factory. Perhaps too many, from a coldly financial point of view. It would be a great loss to British aviation if the postponed meeting of creditors should decide on liquidation.

From these somewhat gloomy contemplations it is cheering to turn to the other side of the ledger, which shows that the value of new aircraft sold abroad this year is likely to reach the £12 million figure, while engines and spares may bring in another £10½ million.

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Forthcoming Events, page 619.

NORTHERN LIGHT: Now undergoing preliminary flight trials at Prestwick is the Scottish Aviation A.4/45 light military communications aircraft, which made its debut at Radlett this year. The civil version is the Prestwick Pioneer. Both types have a Gipsy Queen engine.

"Flight" photograph

The scene in the Model Room during a discussion of factors affecting the establishment of an overseas base—actually Algiers. Wing Commander Hodges, a Directing Staff Officer, is making a point.

Joint Services Staff College

Excellent Progress at Latimer : Aims and Methods

IN the Navy, Army and Air Force *Lists* (still firmly withheld from the public) the symbols "j.s.s.c." after the name of an officer signify that he has successfully completed a course at the Joint Services Staff College. At this quiet seat of Service learning, in the lovely valley of the Chess, at Latimer, Bucks, the history, aims and activities of the College were lately described for us by the Commandant, Rear-Admiral C. E. Douglas-Pennant, C.B., C.B.E., D.S.O., D.S.C.

An inspection, during which one was able to sit-in on a "scheme," left one with an impression of earnestness without academic stuffiness, and of a real determination on the part of students to see the other man's viewpoint. The spirit and accomplishments of the College should go far towards securing that co-operation among the Services which was such a potent factor in our victory and was so patently lacking among our enemies.

The J.S.S.C. is a young college: it was as recently as February last year that Admiral of the Fleet Viscount Cunningham of Hyndhope proposed such an institution to his fellow Chiefs of Staff. Rear-Admiral Douglas-Pennant was instructed to have the College in operation by January 1st this year and though, in fact, the opening date was January 20th, he had the satisfaction of being ten days ahead of the American Armed Forces Staff College which likewise should have come into being on the first day of the year.

It will be noted that the word "joint," rather than "combined," is used in the designation of the College. This is because in modern Service terminology the word "combined" signifies operations by two or more allies. Though administrated by the War Office, the J.S.S.C., like the Imperial Defence College, comes under the Chiefs of Staff Committee for all matters of policy. Its aims are to train officers who are already qualified in the staff work of their own Services for staff appointments on joint staffs, and in so doing to improve their qualifications for higher staff appointments in their own Services; to develop mutual understanding and a common doctrine among the Services; and to evolve a standardized system of staff work.

Syllabus

The six-month course is on a fairly high level and principles and higher staff work, rather than details, engage the attention of the students. Details are dealt with at the Service Staff Colleges (Greenwich, Camberley and Bracknell) so that the J.S.S.C. forms an intermediate step between these establishments and the Imperial Defence College. The syllabus is as follows:—

(1) The organization and capabilities of the three Services, their relationships with each other and with Government departments.
(2) The planning and execution of all types of joint operations.
(3) The broad administrative aspects of joint operations.
(4) Imperial strategy, including the governmental machinery for the central direction of war, the system of higher command and co-operation with the Dominions.
(5) The broad problems of war production, production methods, economics and allocation of manpower, and their relation to the fighting Services.
(6) The influence of scientific and technical progress upon strategy and tactics.

A full course of pupils would be made up of the following

"Flight" photograph.

Rear-Admiral C. E. Douglas-Pennant, C.B., C.B.E., D.S.O., D.S.C., Commandant of the Joint Services Staff College, with his Directing Staff Officers.

Joint Services Staff College . . . . .

officers: Royal Navy (including Royal Marines) 20, Army 30, R.A.F. 30, Civil Service 12, Dominions 12. The Commandant expressed his disappointment that only one Civil Servant—an Admiralty scientist—has taken the course, for he feels that great benefits would accrue if the right type of man could be spared for six months from the Treasury, the Service Ministries and the Board of Trade. Again, the Dominions are finding it difficult to provide officers for the course, though at present one Australian, two South Africans, two New Zealanders and four Canadians are at Latimer. Most of the students hold the rank of Commander, Lieutenant-Colonel or Wing Commander, though there are a number of the ranks immediately above and below these.

The directing staff consists of the Commandant (this post is held in rotation by an officer from each Service), three Senior Directing Staff Officers (one from each Service, of rank of Captain, R.N., or equivalent), and fifteen officers (five from each Service, of the rank of Commander or equivalent). The S.D.S.O.s at present are: G/C. C. G. Barrett, C.B.E.; Captain M. L. Power, C.B.E., D.S.O.; and Col. T. E. D. Kelly, C.B.E. Directing Staff Officers from the Royal Air Force are: W/C. R. S. Allen, D.S.O., D.F.C.; W/C. P. C. Fletcher, O.B.E., D.F.C.; W/C. L. McD. Hodges, D.S.O., D.F.C.; W/C. R. T. F. Gates, D.F.C., A.F.C.; and W/C. P. H. Holmes, O.B.E.

Instructional Methods

As far as possible instructional methods follow those employed at the Universities; this the Commandant considers to be of special value at present as all students have war experience which, when pooled, is of the greatest value. The students are divided into "syndicates," the composition of which is changed four times during each course, so that the Services and the arms of each Service are mingled. Each syndicate is under the guidance of a Directing Staff Officer who is present at all discussions and conferences, though the handling of these is left as far as possible to the students themselves. Instructional methods include lectures, discussions, written exercises, model demonstrations and visits to Service establishments.

Apart from lectures delivered by the Directing Staff Officers a large number of "specialist" talks are given by outside authorities, and a considerable amount of time is set aside in the syllabus for subjects of general interest, such as economics, colonial development, foreign affairs and scientific research. Written exercises may be either individual or joint efforts, the object in the latter case being to train officers to produce the sort of papers required by a joint planning staff. Exercises include, for example, the preparation of strategic surveys, appreciations and operation orders. On conclusion of these exercises, model demonstrations are held.

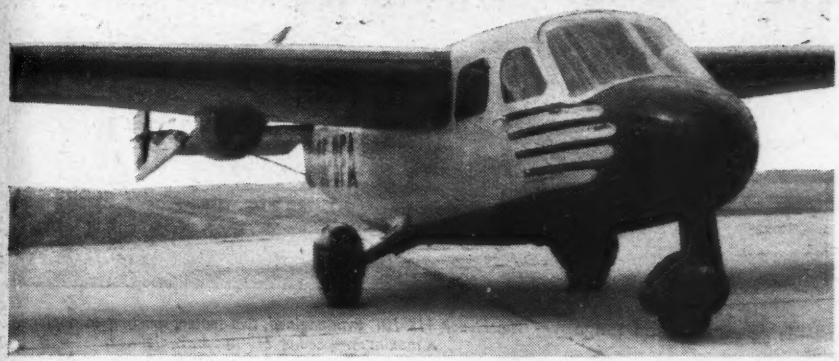
"Flight" photograph

A "syndicate" debates the forms of anti-aircraft defence to be employed at an overseas base.

Czechoslovak Twins

Three Unusual Designs with Walter Minor Engines

By WILLIAM GREEN

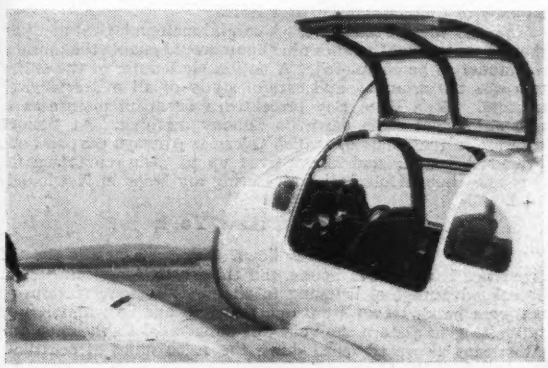


The 4/5 seater Praga E.211, built in the National factory at Karlin.

THE last few months have witnessed the appearance of a number of new and interesting Czechoslovak prototypes. Of especial interest in that they illustrate the first results of a two-year reconstructional period (during which time the only aircraft of national design to be produced were in the light single-engined club and touring category), the new prototypes are twin-engined touring and taxi aircraft and are all powered by the 105 h.p. Walter Minor 4-111 air-cooled engine.

The Praga E.211, built by the National factories at Karlin, is unique in being a 4-5 seat twin-pusher-engined taxi or touring monoplane with a fixed tricycle undercarriage, and has been developed from the 1938 Praga E.210. The E.210 was extensively tested, both by the Czechoslovakians and the Germans, during which tests the original tail-down undercarriage was replaced by one of fixed tricycle type. However, the war intervened in the further development and production of the E.210, and it was not until the Germans withdrew from Czechoslovakia that work on the E.210 was recommenced. The E.211 is basically similar to the 210 in layout, but has been considerably redesigned and modified, the most noticeable external modification being the three tail fins which replace the original twin fins of the E.210. The cantilever high-wing is of wooden two-spar construction with plywood covering, is built in one piece, and has fabric-covered slotted ailerons of welded steel-tube structure. The fuselage is a rectangular structure of welded steel-tubing, the nose of which is covered by plywood and the remainder by fabric. Tailplane and fins are of wood with fabric covering, and the elevators have welded steel-tube frames and are also fabric covered. Trimming tabs are positioned in the elevators. The undercarriage wheels are sprung with air-oleo shock absorbers and are enclosed in streamline fairings. The cabin, which seats 4-5 persons, is located forward of the wing leading-edge and affords a good view for the occupants. Access is via doors in the port and starboard sides, that on the port side for the occupants of the rear seats, and that on the starboard for the pilot and co-pilot. Dual wheel and pedal type controls are installed.

Performance is as follows: Maximum speed, 149 m.p.h. at sea level, cruising speed, 130 m.p.h., landing speed, 53 m.p.h., range at cruising speed, 350-400 miles. A light freighter version of the E.211 will also be produced, and a larger model, the E.212, seating eight passengers, is under construction at Karlin.



Close-up of the Aero 45 showing the ample dimensions of the cabin entrance.

The Aero 45

Approximating to our Miles Gemini in that it is a four-seat low-wing monoplane intended for touring and taxi operation, the Aero 45, built at Vysočany, flew for the first time last July. The Aero 45 has very pleasing lines and is of modern all-metal construction. The wing is manufactured in three sections, the centre-section of which is built integral with the monocoque fuselage. The tail-down undercarriage is fully retractable. The cabin seats four persons, and the controls are of dual half-wheel and pedal type. Access is effected via a section of the canopy which hinges

The four-seater Aero 45 which, in common with the other types described in this article, has two 105 h.p. Walter Minor 4-111 engines.

Czechoslovak Twins . . . . .

The Hodek HK-101 twin-engined, two-seater, sporting monoplane. A maximum speed of 219 m.p.h. is claimed.

to fold upwards. A comprehensive selection of instruments is installed, including full blind-flying equipment. Optional equipment includes electric starters, radio receiving and transmitting apparatus, cabin heating, and variable-pitch airscrews. Power, as with the E.211, is supplied by the 105 h.p. Walter Minor 4-111 engine. Maximum speed is 180 m.p.h. at sea level, cruising speed is 155 m.p.h. at 75 per cent rated power, landing speed—with flaps—is 53 m.p.h., and range at cruising speed is 560-620 miles.

A much smaller aircraft than the two previously mentioned types is the Hodek HK-101 twin-engined two-seat cantilever monoplane built by the only remaining unnationalized aircraft manufacturer in Czechoslovakia—V. Hodek of Prague. The HK-101, which recently commenced flight trials, is of all-metal construction. The wing is constructed in three sections, the centre section being built integral with the semi-monocoque fuselage. All control surfaces are of metal, with fabric covering. The undercarriage is of tail-down type, and the main wheels are manually retractable, the steerable tail-wheel being fixed. The cockpit seats two persons in tandem, and the complete canopy hinges to the starboard side in two sections for access. The two Walter Minor 4-111 motors afford a maximum speed of 219 m.p.h., a cruising speed of 187 m.p.h. at 65 per cent rated power, a landing speed—with flaps—of 69 m.p.h., and a range at cruising speed of 562 miles. The HK-101 can climb to 3,280 feet in 3 minutes. Dual stick and rudder bar type controls are installed, those in the front cockpit being disengageable.

The aircraft is very small, the wing span being only 25 ft 3 in, and the cockpits are naturally somewhat cramped. However, the HK-101 should prove popular with the sporting pilot who requires performance rather than superlative comfort, and its appearance at future International meetings should create considerable interest. The manufacturers state that plans exist for the production of a single-seat version, and that the two-seat version will also be available with a wing of increased area.

RIDING THE RANGES

By "BIG DIPPER"

ONE of my first thoughts as I touched down at Bovingdon airfield (having flown over 7,000 miles to New York and back in 97 hours) was how rapidly such an unusual passenger trip will become out of date. The time may not be very far distant when the piston engine will give way to the airscrew turbine for such Atlantic travel as I undertook. Although the journey was tiring, I was able to spend two pleasant days in New York, and to study the procedure under which charter aircrews negotiate their journeys.

The aircraft was a Handley Page Halton; it was flown for the Lancashire Aircraft Corporation by Captain Tony Kimmins and his crew of four. It was the third charter flight undertaken by the Corporation to repatriate United States sailors who had delivered tankers to shipping firms in this country. American sailors are highly paid by any standards, and it has been found more economical to move them by air charter than for the employers to continue to pay wages while the seamen await a long delayed sea passage before being paid off in New York

Owing to bad weather around Iceland, the route Liverpool-Azores-Gander-New York-Gander-Bovingdon was taken. No doubt, in a few years' time, airscrew turbine aircraft will defeat the weather with their speed and altitude, and will complete such a journey as this in one-third of the time. But the "slothful" travel of 1947 had its compensations. My flight commenced at Speke on a foggy Saturday afternoon, and Kimmins and First Officer Douglas Evans rode over beautiful cloudbanks on the route to the Azores, on a warm Atlantic evening. There were plenty of bumps to be had a little lower, but Kimmins found a helpful beam wind at 10,000 feet and provided me, and his passengers (some 19 American sailors who were returning home) with a sight of the grandeur of Atlantic cloud formation. The sailors, although out of their element, took well to the air, but the miles of sun-touched cloud must have contrasted strangely with their more usual vision of sea and white-topped waves.

Santa Maria in the Azores is a pleasant little island. The airfield was built by the Americans and taken over by the Portuguese Government. Here the aircraft was efficiently serviced by British South American Airways. W/C. Fountain, late of Transport Command, has recently been appointed B.S.A.A. Station Manager here. His hospitality and help, and that of his wife, make a pleasant recollection, and so does the humour of Chief Engineer Jock Neish.

The stay was all too short. A careful meteorological analysis showed that a flight plan of nine hours would enable the journey to Gander to be completed. A noticeable feature of the entire trip was the accuracy and careful study of all meteorological matters. Bona Vista Bay presented a beautiful picture as it was unfolded by the dawn on Sunday morning. At Gander we were in the hands of British Overseas Airways Corporation. Friends Wheatley and Moore lived up to their reputation for care and thoughtfulness for all during my stops in Newfoundland.

Arrival in New York

Then for the radio ranges down the coast, across the St. Lawrence River, Nova Scotia and the North American States. I took advantage of listening to all the R.T. conversations as we were handed over from one range to another, and it was interesting to discern the voices of Canadians, Englishmen and Americans as we travelled down the 1,000 miles of coastline. An undelayed landing at La Guardia was the pilot's reward for giving and keeping to an accurate E.T.A. Runway 22, our destination, required only one left-hand turn over the Hudson River, and we were down at New York 26 hours after leaving Liverpool. The American sailors were paid off by their company that afternoon.

The return journey from New York, which commenced on Tuesday afternoon, was a repetition of the efficiency experienced on the way in—the same radio ranges and a similar reception at Gander. Then, for the last leg carrying freight back to England. In the meteorological office we studied one of the usual deep depressions which cover the Atlantic at this time of the year, but winds ranging from 75 to 40 knots were to be found around the Southern curve of it. The Halton, with its four 1,600 h.p. Hercules engines, had its cruising stepped up proportionately, and a clear glimpse of what future speeds hold in store was afforded by an achieved flight plan of nine hours direct from Gander to Bovingdon, a distance of 2,335 miles.

FLYING IN THE SUDAN

New Radio Convoy System Overcomes Most Objections to Original Visual Contact Regulation

By W/C G. R. LEATHER-BARROW

FEW Notices to Airmen in recent years have aroused such a storm of protest, and provoked so much comment, as did the Sudan Government Notice to Airmen No. 3 of the year 1947, which laid down, amongst other things, that all aircraft not fitted with serviceable two-way W/T would be required to fly through the Sudan in convoy with another aircraft of similar type. Both the industry and the private owners complained that inevitably there would be delay at the Sudan frontier while such a convoy was organized, the former stressing particularly the adverse effect this would have upon Britain's export drive, and the fact that aircraft forced to wait, without hangar accommodation, would deteriorate in the Sudan weather.

THE author is Deputy Assistant Civil Secretary (Air) in the Sudan Government, a post which corresponds to Director of Civil Aviation. In this article he explains the need for the unpopular regulation which stipulated that aircraft not fitted with two-way W/T must fly in convoy. He describes tests which have resulted in a new regulation by which aircraft may fly in radio convoy and out of visual range of one another. The scheme would appear to have applications in other parts of the world.

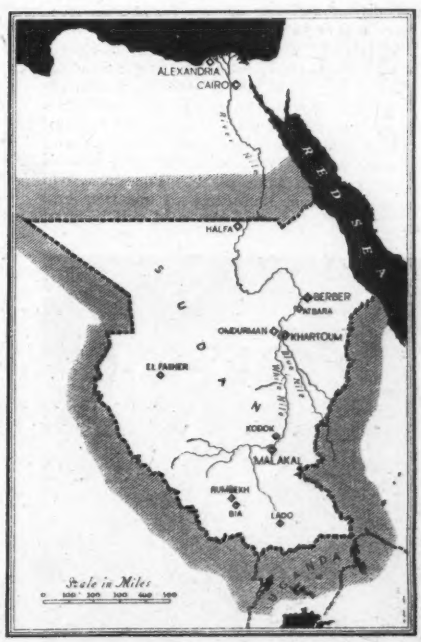
Many protests were addressed to the Government in Khartoum, and as many suggestions and solutions offered. Most people, however, lost sight of the fundamental reason for the rule, which was designed for the protection of those flying in the Sudan, and in an attempt to lessen the hazards of flying in this desolate and dangerous part of the world. The administrative staff in the Sudan is very small when the vast area covered is considered. Consequently, when an aircraft is reported to be missing, all work in the area is obliged to stop while the search is in progress. This fact, and the very considerable cost of both ground and aerial search, were strong additional reasons for the introduction of the convoy rule.

Camouflaged Landmarks

Those who complained forgot that navigation in the Sudan is most difficult, particularly to the comparatively inexperienced pilot-navigator. They forgot that landmarks are few and far between and not easily recognizable; that the maps are misleading to those who don't realize that, whereas a name on the map in England generally means something, in the Sudan it *might* mean that before the villagers had decided to move it there had once been a village of ten tukls there (a tukl is a small, round, thatched native dwelling, and is about the most perfectly camouflaged object in the world); that the road shown so reassuringly on the map is generally a variable quantity according to the season, and that consequently it might branch without warning into three or more parts, any one of which could be the road one is relying upon for a ground-speed check. And finally, that if one does have the misfortune to force-land through either lack of petrol caused by chasing an illusive, will-o'-the-wisp airfield, through bad weather, or through engine failure (which can happen to even the most modern engine) then unless help is forthcoming fairly quickly it might as well not come at all.

If an aircraft is equipped with W/T it can send an S O S giving the approximate position of the intended forced landing which will, even if inaccurate, give the searching parties some indication of the area in which to search. Without W/T, search parties know only that an aircraft is missing somewhere in an area about five hundred miles long and of indefinite width. The chances of a quick rescue are remote, and meanwhile the unfortunate crew, and perhaps passengers, are languishing in either the burning deserts of Northern Sudan, or in the swamps of the South.

If, on the other hand, two aircraft are in convoy, and one of them is forced to land, the other aircraft can plot the position of the forced-landed aircraft, see whether the occupants are safe or require medical attention, and pass such information to the Aerodrome Officer immediately after landing at the destination, so that action can be taken without delay to start rescue operations. It is realized that there are occasions when both aircraft will get lost, but the chances of this happening are fairly remote, and the convoy system provides a measure of protection and security not otherwise present. In flying, every precaution taken is one step nearer the goal of complete safety in the air.



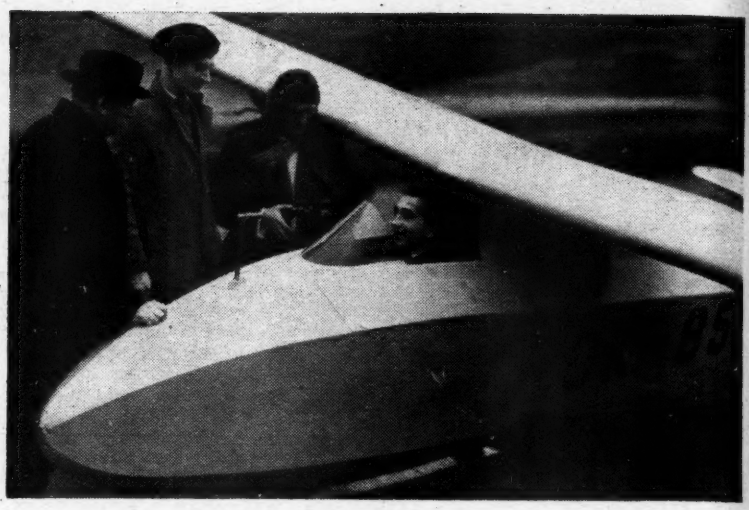
Following the Nile

Opponents of the system have suggested that provided a pilot keeps to well-defined tracks, and follows easily recognizable landmarks such as the River Nile, he will, in the event of a forced landing, always be near human habitation and will, therefore, be rescued quickly. To guarantee such good behaviour, they suggest that he might made to deposit a sum of money, forfeit if he is proved to have strayed. Such an argument forgets that all the air routes in the Sudan are so planned, most of all the well-used North-South route, and that, as explained above, landmarks are *not* easy to find. No pilot gets himself lost for the fun of it, and no monetary guarantee will prevent him from getting lost, once his map has ceased to bear resemblance to the ground below him. Further, the total population of the Sudan is only 7,000,000 spread over a country of 967,500 square miles, and so the chances of being near human habitation when the times comes to make the forced landing are fairly small.

Another school of thought argues that R/T or V.H.F alone should suffice, not realizing that the Sudan is a poor

(*Concluded on page* 604.)

HERE AND THERE



25-HOUR GLIDER FLIGHT. Congratulations from Mr. Albert Walker, manager and ground engineer of the London Gliding Club, Dunstable Downs, to Mr. Ladislas Marmol when he landed after remaining airborne in the "Knajarek" for 25 hours. Mr. Marmol, a Czech resident in England, set out to beat the Czech single-seater gliding record and went on to beat the British record.

Clubs Face Close-down

AN interview with the Minister of Civil Aviation, Lord Nathan, has been sought by the Association of British Aero Clubs. It is intended, *Flight* understands, to tell the Minister that with post-war increases of operating costs and the new petrol restrictions, clubs will not be able to carry on without assistance, and will have to close down this winter. In some cases, of course, clubs have already had to do so. Another point that will be raised is the proposal to institute medical examinations for pupils which would, it is considered, prove unnecessary and a deterrent to prospective flyers.

U.S. Silvaire Ready Soon

THE new all-metal, four-seater Silvaire private aircraft will be at the deliveries stage soon, and is to cost $6,995.00 ex-factory. Developed by the Luscombe Airplane Corporation, Dallas, Texas, the Silvaire is a high-wing design with a service ceiling of 16,000ft, a range of 500 miles, cruising speed of 130 m.p.h. in still air, and a rate of climb of 900ft per minute. With 4 persons, 42 gallons of fuel, and baggage, the gross weight is approximately 2,280 lb.

Bigger and Worse

IN spite of the atomic bomb, America is continuing development of normal h.e. bombs and has evolved a 42,000-pounder, twice as big as the R.A.F.'s "Ten-ton Tess." It will shortly be dropped experimentally in the Californian desert from a Super-Fortress. Too large to be contained entirely in the bomb bay, the bomb will protrude in flight.

Surveys in the Middle East

SHORTLY leaving for Iran, a Bristol 170 operated by Hunting Aero Surveys is to prepare a survey of oilfields for the Anglo-Iranian Oil Co., Ltd. Its equipment will include a camera station, a supplementary 300-gall. fuel tank and oxygen apparatus to enable operation at 22,000ft to take place. The crew will number five, including an observer and photographer, and the hold will be used for photographic equipment. Abadan, at the head of the Persian Gulf, will be the aircraft's base.

DR. ECKENER BACK IN GERMANY. After working in the U.S.A. for a year and a half Dr. Hugo Eckener, the airship designer, is back in Germany. He is here seen with newspaper correspondents at Frankfort. Dr. Eckener is 79 years old.

U.S. Weather Stations

MAJOR LAWRENCE S. KUTER, United States representative on I.C.A.O., has criticized his country for delay in manning the 7½ Atlantic weather stations which were the American responsibility under the 1946 Agreement. Ships at seven stations are to be maintained by the U.S. and an eighth is to be manned half the time by a Canadian ship. Thirteen stations were regarded as the minimum. The U.S.A. was only manning two stations, said Major Kuter, whereas Portugal, Holland and Belgium had met their obligations in full.

Liverpool-Manchester-London

AT the beginning of next week, December 1st, B.E.A. commences a new service between Liverpool, Manchester and London with 18- and 21-seater Douglas C.47s on weekdays only, replacing the existing service. Timings will be Liverpool, depart 0809; Manchester, arrive 0829, leave 0844; arrive Northolt 0954. The Northolt-Liverpool service will depart at 1915.

Air Functions

ON December 4th, the Master, Wardens and Court of Guild of the Guild of Air Pilots and Navigators will be installed at a ceremony at Londonderry House at 6 p.m., and a reception is to follow. All members are invited to attend but only official guests will be present. The subscription is £1 1s.

The annual dinner of the Aerauto Association is being held on November 29th, at the Albert Tavern Restaurant, Victoria Street, London, S.W.1.

R.A.F. Review

IT has been decided to make *The Royal Air Force Review* available to former members of the services. The subscription is 7s 6d a year, and the review may be obtained from the Air Ministry (P.9), Kingsway, London, W.C.2.

Flying Food

AT a Montreal air conference organized by the Board of Trade an unusual lunch was served, all the items being flown in. They included paw-paws from

Africa, swordfish from Bermuda, flowers from the Yukon and France, dates from Iraq, mangosteens from Malaya, and (rather a homely note) Brussels sprouts from England. The object was to demonstrate the fine flavour of foods brought quickly by air.

Moving a Factory by Air

AUSTRALIAN National Airways is moving the six rolling mills of Australian Bronze, Ltd., from Sydney to Hobart, Tasmania, the total weight being 60 tons. Plant is dismantled on a Friday, flown over the week-end and erected on Monday, so that production is not seriously interrupted.

"Spit" Trainers for Netherlands

AN order for three Supermarine Spitfire, dual-control trainers has been placed by the Royal Netherlands Air Force. They will be conversions of Mark IX fighters. The prototype, it may be recalled, was adapted from a Mark VIII airframe.

Belgium–N.Z Light Plane Flight

AFTER a 20-day flight from Belgium, a new Zealander, Mr. H. B. Newton, arrived at Brisbane on October 7th. He flew an Ercoupe with a range of about 500 miles and fitted with two compasses and radio. On one of the later stages he homed onto the Darwin radio beacon from 400 miles out to sea. The route taken was through France, North Africa, Palestine, Irak, Iran, India, Malaya and the Netherlands East Indies, and Mr. Newton, who averaged 600 miles a day, reported that there was "nothing to a flight of this kind."

Airline Bookings by Pigeon

PEOPLE on Pelsart Island, 38 miles off the coast of Western Australia, may now book an air passage to the mainland by pigeon post. The Postmaster-General has been asked to provide radio communication, but in the meantime, the MacRobertson-Miller Aviation Company is using this unusual method of booking passages.

TWO HALVES: Consolidated Vultee's "flying auto" with detachable wing, made a first flight on November 15th and remained aloft about two hours, but three days later force-landed and was wrecked. Aircraft and motor car components have separate engines.

News in Brief

The air speed record of 496.88 m.p.h. set up by G/C. Cunningham in a D.H. Vampire over a 100 km. course at Lympne on August 31st has been recognized by the Federation Aeronautique Internationale as a Class C international record.

* * *

There has been controversy about the use of Streptomycin, a new drug powerful in its effects on certain complaints but liable to be dangerous. The Canadian Air Line Pilots' Association has pointed out that one effect of this drug may be permanent impairment of the balance mechanism in the inner ear.

* * *

Capt. G. F. Moss, a B.O.A.C. pilot, is to be a flight supervisor. He has flown nearly 1,000,000 miles.

* * *

K.L.M. flew films of the Royal Wedding to Amsterdam, where they were transferred to an aircraft bound for Singapore. They were to be flown on by QANTAS to Sidney and shown in the city's cinemas on Monday last.

* * *

On December 1st a QANTAS Constellation will start a weekly consignment of food parcels for Britain. Each Constellation will carry 2,000 lb of food.

* * *

Tiger Moths are being used to combat a plague of grasshoppers threatening late crops and pastures in Australia.

* * *

The Ministry of Supply has stated that during the six months ended on September 30th, the labour force in the principal aircraft factories was estimated to have decreased by 4.2 per cent.

* * *

In a reply to a question in Parliament, the Minister of Supply stated that 493 R.A.F. officers and 3,558 other ranks were employed by his Ministry on work for the Air Ministry.

* * *

With the taking over of new range areas for the South Australian rocket testing ground at Woomera, a total of 2,000 sq. miles is now provided.

* * *

Air cameras for survey work made by a London firm, the Williamson Manufacturing Co., Ltd., are now being used by K.L.M. Demonstration equipment is at present in Sweden and technicians are shortly visiting Turkey.

* * *

The American Society of Photogrammetry is to hold its 14th annual meeting on January 21-22 at Washington. Air survey firms, equipment makers and government agencies are to co-operate in an exhibition.

* * *

Mr. D. W. Plaistowe has become commercial director of the Glacier Metal Co., Ltd.

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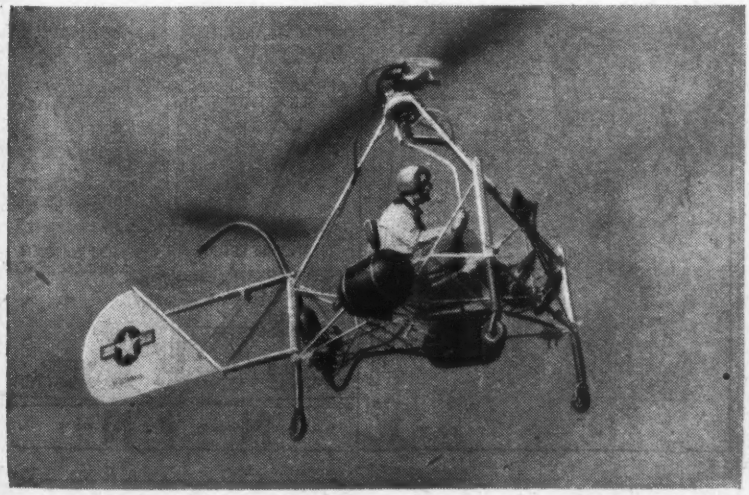
The pleasures of flying without exertion are to be sampled by two swans and a pair of Magellan geese, a present from the British Government to the Dutch. They are travelling by K.L.M.



JET HELICOPTER: The McDonnell helicopter is another novel machine to make its first test flight recently. The rotor blades are spun by ram jet units. The McDonnell Corporation has worked together with the U.S.A.A.F. in its design.

PEACE (of MIND) IN OUR TIME

A Plea for Using Approach Equipment which has Stood the Test of Long Usage

By "RESURGAM"

THE author is a pilot of more than 20 years' experience, his "B"-licence dating back to 1929. We feel, however, that there are objections to his scheme, notably from the point of view of the operator of small aircraft, who would have to carry both I.L.S. and S.B.A. receivers.

Airfields equipped as suggested would still be used by aircraft fitted with I.L.S. only but could not be used by aircraft having S.B.A. only, since the beam is at right angles to the runway.

A preferable scheme might be to have both systems function in the normal manner, every aircraft fitted with a V.H.F. receiver and so permitting the use of Airfield-Controlled Radar and Ground-Controlled Approach for actual air traffic control and for monitoring.

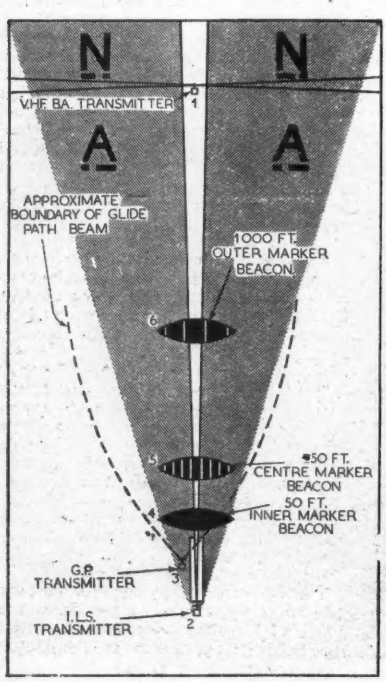
NOT everyone has heard the true story of the R.A.F. Form 765C—or Accident Report Form—which arrived at a certain Group Headquarters with the space for "Cause of Accident" filled in—"What goes up must come down"! It is in the interest of aviation that this story should be repeated now, for we appear to be in danger of forgetting some of the basic truths of flying in heavier-than-air aircraft. Let us consider some aspects of this admirably brief truism and couple it with the policy of civil aviation as expressed by our Civil Air Minister: "Let us have safety in air line travel—safety first, second and third"!

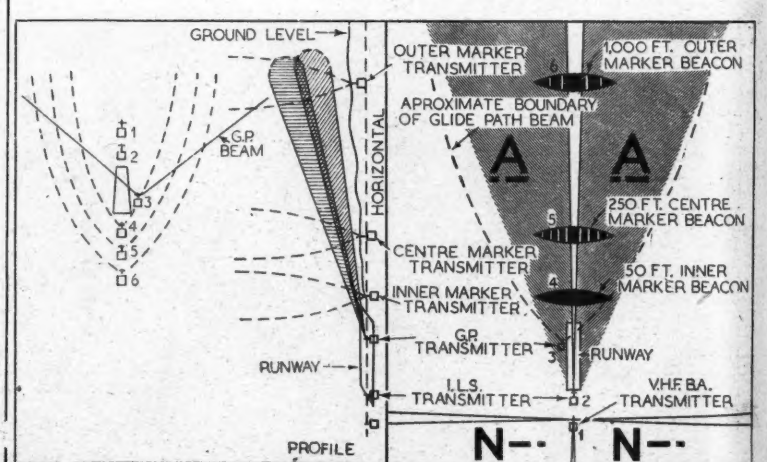
Since accurate navigation and safe airfield control are prerequisites to safe flight, let us concern ourselves in detail with the homing and approach aids at airports. The methods and systems used at present to assist arrival in the vicinity of an airport include Dead Reckoning and W/T bearings, Radio Range, Omnidirectional Beacons, Standard Beam Approach, Instrument Landing System, Gee and Ground Controlled Approach. But all these systems have their particular weaknesses and limitations. For instance, D/R is liable to human error and miscalculation; W/T bearings congest the radio frequencies; the Range and Omnidirectional Beacons may be blotted out by static; S.B.A. and I.L.S. only offer sector identification of position and give no immediate indication of whether the aircraft is approaching towards, or flying from the airfield; Gee is excellent for obtaining accurate fixes, but it cannot be used for making a final approach, and does not, as yet, embody a communication channel within itself; G.C.A. presents a language difficulty and is too slow for standardization.

Let us put aside, for the time being, our plans for the marvellous radar aids and the supersonic airliners of the future and, before our petrol and our passengers' patience are exhausted, think of a system for bringing our poor little present-day airliner (and ourselves) safely down to earth. Doubtless, in course of time, the ideal system will be evolved, but to those who are serving as airliner captains, that is a "time-sentence" indeed! *Nota bene*—in this interim period, with no standard of minimum equipment laid down, where is the efficacy of the "Safety first, second and third" civil aviation policy? Remembering the proverb "a bird in the hand," let us not despise that equipment which, even if the pundits do not extol it as the latest thing, has stood the test of practical use over a period of years.

Available Equipment

I.C.A.O. recommends standardization of the "Instrument Landing System" at all major airports, and the equipment can be produced in this country for immediate installation. S.B.A. is also immediately available. Miniature Gee will also be available in the near future. It has been suggested that with such equipment installed and used to its full potentiality, a system would exist sufficiently adequate to serve all eventualities likely to be encountered in the next ten years.





The alternative schemes to assist orientation and approach, as suggested by "Resurgam," are illustrated diagrammatically. On the left the S.B.A. beam is sited across the approach, whereas on the right it is in the back beam. The blue (starboard) and yellow (port) sectors of the I.L.S. beam are indicated in the diagrams by shading.

Peace (of Mind) in Our Time . . . .

I make the following suggestions as the essential requirements of a "perfect" airfield approach system: Immediate quadrantal orientation over the destination airfield; an approach-path indicator accurate in azimuth and glide angle; accurate definition of the start and finish of available approach and landing aids, and also definite indication of overshoot; also a warning device to ensure safety of aircraft in the event of failure of ground equipment. It is desirable, although not, strictly speaking, necessary, for the pilot to receive some indication of his distance from the airfield when on his final approach, either continuously or by spot indication.

In the first place it must be understood that S.B.A. gives aid by aural indication, and I.L.S. by visual indication. S.B.A. gives indication of aircraft position in azimuth in relation to the runway, with periodic spot distance indication, but the alleged glide-path may be ignored as such. This system depends upon careful timing and the use of supplementary instruments, such as a sensitive altimeter. The I.L.S. is a complete runway approach system, independent of any other instrument in that correct interpretation of, and action on, the indications of the single instrument will result in the aircraft arriving on the relevant airfield runway.

The disadvantages of I.L.S. are, in my opinion, first its inability to give definite quadrantal position indication, and secondly, in the method of presentation, the visual indicator gives correction indication in the American manner, which is opposed to the position indication that is standard in British practice. A distinct disadvantage of the S.B.A. system is the inability to present a precise line-up with the runway at the turn-in for approach, owing to the width of the beam. The system also lacks a definite glide-path indicator, with consequent dependence upon a sensitive altimeter. The inability to give quadrantal position indication is common to both systems.

It is suggested that the inherent weakness of S.B.A. and I.L.S. could be eliminated by combining the two in such a manner that they became complementary. The advantages of both systems could be made use of, and the disadvantages of both nullified, by placing an S.B.A. transmitter in the back beam of an I.L.S.-type layout, and at right angles to the localizer path. Advantages are immediately apparent from their combination. Alternatively the S.B.A. or VHF/BA transmitter could be sited in the front beam of the I.L.S. The S.B.A. channel could then be used both for identification of the station by call-sign, and the reception of any emergency vocal transmissions from Control, and further, the S.B.A. beam would provide an alternative method of "homing" and an alternative means of "stacking," within the airfield Control Zone. It will be appreciated that by such use of the S.B.A. the inaccuracy of directional indication and the lack of a glide-path are of no account. The inability of both systems to give quadrantal indication has also been overcome. Further, an important advantage is claimed for the installation of the combined system, in that it may be used in all ways as a Radio Range, but it has the inherent advantage over the normal M/F Radio Range system, in that V.H.F. minimizes the effects of "static."

Quick Orientation

It will be found that any aircraft approaching from any direction may be immediately orientated by the aural and visual indications received. The combined indications do not permit alternatives. Thus blue and "A," blue and "N," yellow and "A" and yellow and "N" each denote an individual quadrant.

The suggested layout is achieved with transmitter and receiver equipment which is easy to install and cheap to maintain. It provides a pilot-controlled approach and landing system, and the necessary facilities for Control within the Airfield Control Zone. The aircraft equipment weighs the equivalent of one passenger. It is also accurate and will permit an aircraft to make a safe descent in conditions of 50-ft ceiling and 50-yd visibility (laid down by B.A.L.P.A. as operational limits). In emergency, it will allow an aircraft to be brought down in fog, thus providing the ultimate margin of safety and avoiding the recurrence of incidents similar to the unfortunate debacle in Kent this year.

Within itself the system embodies a Communications Channel, the basis for a method to deal with high-density traffic, and is subject to the minimum interference from "static"; it has all the advantages and none of the disadvantages of the Radio Range, S.B.A. and I.L.S. systems; and it gives additional inherent advantages. Moreover, it is available NOW.

Further, by following an interim policy of the immediate installation and use of S.B.A., followed by I.L.S. as available, it would allow high utilization and no wastage of equipment.

SWEDEN'S LOSS

DEEP sympathy will be felt with the dependants of those concerned in the disaster in Italy which overtook a Swedish Government transport aircraft carrying Swedish Air Force officers from Addis Ababa to Rome. The machine is said to have flown into the mountains north of Amalfi. Twenty-one of the passengers were killed and four injured.

The officers involved were on their way back to Sweden from Abyssinia after delivering sixteen Saab 17 reconnaissance dive-bomber aircraft. They set out on their long journey to Abyssinia on October 30th. The flight was under the control of Count von Rosen, and the route was via Angelholm, Amsterdam, Nice, Tunis and Khartoum. The engines of the Bristol Freighter in which the crews were returning appear to have given no trouble to account for the accident.

LONDON CLUB'S POST-WAR REUNION

IN spite of their problems and anxieties, the flying clubs are not allowing austerity to creep in on their annual parties. Last Friday, November 21st, it was the London Aeroplane Club's ball which attracted a large number of guests to the Dorchester Hotel. Friends representing clubs as far away as Derby gathered together with veterans of the London club and members of the de Havilland Technical School, now associated with it and flying from Panshanger.

Everyone was agreed that it was a first-class affair and well worthy of the occasion—the first post-war reunion. The club was started in 1925 and so came of age at the end of the war.

During the evening W/C. Clem Pike made a presentation to Major K. M. Beaumont, D.S.O., and, in his absence, to Cdr. H. E. Perrin, C.B.E., in recognition of their services over many years to the club. Major Beaumont and Cdr. Perrin have both been with the club since its beginning, the former being its first *ab initio* member. Cdr. Perrin was unfortunately not sufficiently recovered from his recent illness to be present. Major Beaumont made a short and appropriate impromptu speech on behalf of both recipients. The gifts were most attractive, mounted models of Gipsy Moths.

A sealed time-of-arrival competition at the hotel won a box of chocolates for Mr. Lee and partner, and a well-varied cabaret added to the evening's entertainment.

A "FLIGHT" LECTURE

ON Wednesday evening last (Nov. 19th), Mr. John Yoxall, Art Editor of *Flight*, gave a lecture on the photography of aircraft to the Graduate and Students section of the Royal Aeronautical Society. It is always difficult to be unbiased about the work of a colleague, but by any standards, Mr. Yoxall's lecture was of extreme interest. He took his audience through his 35 years' experience, and it was patently apparent that, not only was he perhaps the first man to develop the particular field of his art but that he was, and of course still is, one of the very few masters of aircraft photography.

Advances in photographic apparatus and materials have, of course, made the field available to the photographer enormously wider. But, as in every art form, the classics of achievement which stand by themselves above the common level are dependent solely on the executant. Mr. Yoxall did not display a selection of his choice photographs, rather did he show a selection representative of changed conditions in his work. Even so, there were examples of artistic camera work which must ever stand as models of their kind.—C. B. B.-W.

Flying in the Sudan . . . . .

(*Continued from page* 599.)

country, and that apart from Khartoum airport, where the R.A.F. supply them, there are no equivalent ground facilities. Aircraft would, therefore, be out of touch with the ground for the greater part of their flight. This factor prevents permission being granted for aircraft so fitted to fly unescorted through the Sudan.

An alternative arrangement has been investigated, whereby aircraft, perhaps flying at different speeds, could keep in touch with each other by either R/T or V.H.F., thus flying in radio convoy. It has been proved that an aircraft fitted with either R/T or V.H.F. can keep in touch with another aircraft so fitted up to a maximum range of 100 miles, which means that aircraft with different cruising speeds can still fly in radio convoy, provided that times of take-off are adjusted so that the slower aircraft leaves the ground at a predetermined time, depending upon the difference in speeds, before the faster aircraft. Then, if one aircraft gets into trouble, the news can be passed over the R/T or V.H.F. to the other aircraft and so eventually to the ground.

Practical tests in the air were made, and two trial runs through the Sudan proved that the scheme is practicable and affords the desired measure of protection. The aircraft which took part in the first test were a Gemini and a Dakota; in the second a Consul and a Dakota. In each case the pilot of the escorted aircraft reported completely satisfactory results, and commented on the help given by the escorting aircraft in passing E.T.A.s to the ground via the Dakota's W/T, and in assisting with the navigation by passing wind velocities, weather conditions, etc., to the smaller aircraft. The new scheme has now been officially approved, and a new Notice to Airmen, No. 10 of the year 1947, has been issued by the Sudan Government, cancelling No. 3 of the year 1947.

Contact Before Take-off

It is the responsibility of the pilot who desires radio convoy to make his own arrangements regarding it; for seeing that successful two-way communication with the escorting aircraft is established on the ground before take-off; and for arranging with the escorting aircraft for R/T or V.H.F. watch to be kept during the whole time the escorted aircraft is in the air. It is hoped that one of the chief objections to the old convoy system—that it did not cater for aircraft fitted with either R/T or V.H.F., which were therefore obliged to wait at the Sudan frontier airfields for aircraft of similar speed—has been removed. Aircraft without wireless of any kind are still obliged to fly in visual convoy.

Since the first trials, many other similar flights have been made with complete success, and it is felt that fresh fields for co-operation between the well-equipped airliner and the rather less lavishly fitted-out private or charter aircraft have been opened up, and that the scheme might well have more universal and wider application than was at first envisaged. It is hoped also that by introducing the new system the Sudan Government will have helped to speed-up the delivery of new aircraft to Central and South Africa, and will have removed the chief cause of the annoying and expensive delays which had previously occurred at the frontier airfields of Wadi Halfa and Juba, while still affording pilots the same degree of protection and security as before.

American Newsletter

The Fastest Yet?

By "KIBITZER"

TO everyone's surprise Douglas Aircraft Company have suddenly released details of the Navy's new Sonic D-558 II. The Mark I version of this machine has already made news by capturing the world's speed record from the Army's special P.80.R, but it was not expected that the details of its so-far-secret successor would be released just yet.

Such sudden releases generally have some reason and this may be no exception. But the question is, what is that reason? It can't be fear that the British will suddenly come across with something new in the way of a speed record, so it must be a hidden battle inside this country. Which throws the searchlight on to the Army. But what have the Army got? It seems very doubtful if the P.80.R can ever go as fast as the D-558 I, nor for that matter can the P.84, built by Republic. Perhaps the North American P.86 has frightened the Navy publicity boys, but that machine has only just started its flight tests, and it would be asking for trouble to put it in for the record at this stage—even if it tries for it later.

What then is there? Rumour has been busy, and following a logical line of thought it may be that the Bell X-1 (the XS-2 is not ready to fly yet) has forced the Navy's hand. Yet, if it is the XS-1 it can hardly be a contestant for the world's speed record, for it cannot take-off under its own power on full load, nor has it the endurance. Again the logical deduction is that the Army have gone for, or are shortly going to attempt, an attack on a Mach number of one—or better. This is borne out by a public statement from one of the heads of research here who forecast sonic speeds within a (or was it "the") year.

Personally, I doubt if the XS-1 can actually reach such a high Mach number, even at its designed operating height of over 70,000ft. But even if it does better than 0.9 at that altitude it will be a fine effort, and whoever flies it deserves all the credit he can get. . . . The only strange thing about all this conjecture is that never before have the Army been backward about proclaiming their achievements. Maybe the figures are hard to check, or the attempt is still to come.

Anyway the releases and pictures of the D-558 II show it to be a needle-nosed, swept-back wing machine, powered with both rocket and jet propulsion. Its weight is 15,000 lb and it has a design speed of 760 m.p.h. at sea level and 660 m.p.h. at 35,000ft. The sweep back is 33 degrees on the wing and 40 degrees on the tail, and it has an anhedral of 5 degrees. Its span is 25ft and its length is 45ft 3in. The nose is entirely jettisonable with the pilot. Air intakes are aft of the pilot's position, in the underbelly, and are of the flush type. The Westinghouse 24C engine should give a thrust of 3,000 lb and the rocket reaction motor some 6,000 lb. Chord-wise ribs are situated on the top surface of the main planes to prevent root stalls spreading out span-wise along the wing, and Handley Page slots of the automatic type are also said to be fitted. (A picture was published on p. 572 of last week's issue, 6d.)

So much for the Press release, and further information on this, and the D-558 I may be given in a paper covering the construction and design of these two machines which is to be presented to the Institute of Aeronautical Sciences in the near future. But whatever details are divulged, and however interesting they are, what is intriguing a lot of people here is "who has done what, to whom, and with what?" Time will show, but there is every indication at the moment that the "fastest yet" is around the corner.

'FLIGHT' PILOTS A JET

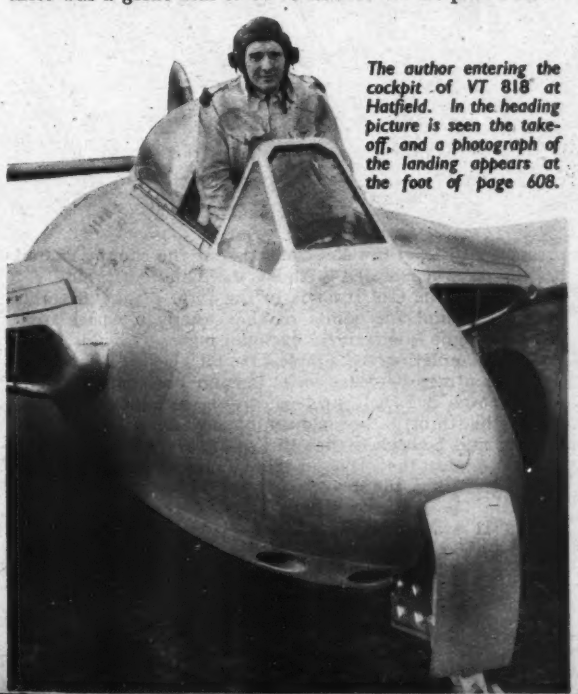
VAMPIRE IN THE AIR . . .

By Wing-Cdr. MAURICE A. SMITH, D.F.C.

A Personal Account of a First Flight in the de Havilland Vampire

ALMOST any fine evening as the sun's rays dim from gold to red, one may stand and gaze into the sky above Hatfield and see a Vampire or 108 whining and wheeling overhead as the test pilot uses up the last precious minutes of daylight. No one can watch such flying without envying the man whose glorious freedom to dive, zoom and circle—the master of a strange element—seems to invest him with power beyond the ordinary being. No pilot could be a witness without longing to be up there, too; all thought of the responsibility, anxiety and physical strain, which exact a price for such speed and freedom of action, forgotten.

A long-standing ambition was fulfilled recently when, at the de Havilland airfield, I was given the opportunity to fly a Vampire jet fighter. It was an exhilarating experience of exceptional technical interest, and one from which there was a great deal to be be learnt. In the past I have recorded my opinions of a number of light aircraft to serve as a guide to clubs and other potential owners. In this instance it would seem to be of greater interest and value to record my impressions as an ordinary pilot of the lighter type of aircraft. Admittedly I have flown many heavy and light Service aircraft, but it is some two years since I flew one capable of over 200 m.p.h. To endeavour on so short an acquaintance with the Vampire to analyze its performance in detail would, in any case, be presumptuous.



The author entering the cockpit of VT 818 at Hatfield. In the heading picture is seen the take-off, and a photograph of the landing appears at the foot of page 608.

The machine flown, VT818, was a brand-new Mk III, just delivered from Preston. In external appearance the main difference between the Vampire III and the I is in the new tail surfaces. Two extra tanks are carried in the wings, each with a capacity of 65 gallons, and the fairings around the attachment for the 100-gallon drop tanks have been slightly modified. In the cockpit there has been a slight rearrangement of instruments on the left-hand side. The lowering and small increase in area of the tailplane and elevator have had no appreciable effect on the controls of the Vampire, although it has been suggested that the elevators of the Mk III feel a fraction lighter when holding off for landing.

The occasion of my flight, much postponed due to bad weather, was a rather threatening afternoon. Several ominous-looking rain clouds were sweeping across the sky from the west; red shafts of sunshine fanned out around them and over the mist and haze above London, while to the west over Dunstable there was an area of cold blue sky.

Briefing

Having perused the pilot's handling notes with care and memorized the essentials, I listened to advice on technique from Mr. Geoffrey Pike, D.H. test pilot, who had shown me round the cockpit. There was no difficulty in remembering the controls and instruments, which are most sensibly arranged and simple to use. Mr. John Cunningham, chief test pilot, was also to have talked to me, but, as usual, he was airborne. Instead, we held a brief post-mortem after we had both landed.

Calmer than I had dared to expect, I slipped the harness straps over my shoulders and clipped them into their quick-release box. I must confess to some excitement tinged with a degree of apprehension. If things went according

'FLIGHT' PILOTS A JET . . .

to the rules, I felt that all would be well, but in an emergency I should have no turbine experience to help me out.

Assurances had been given that the Vampire was simple and sweet to fly, and that everything worked as one would expect. This I was later able to confirm. I had been reminded that the throttle or power control should always be moved slowly, and that jet aircraft do not accelerate quickly from low speeds. A decision to go round again should, therefore, be taken early and full throttle used. A gas turbine takes time to speed-up from idling r.p.m. (3,300 for the Goblin II), so it is preferable to keep revs up on the approach; the difference in the thrust produced at idling speed and, for example, 5,000 r.p.m., is in any case relatively small.

Having familiarized myself with the cockpit, and the method of shutting, sealing and pressurizing it, the time came to start-up the Goblin. One must first make sure that the jet is pointing in a safe direction, and that the ground crew are clear of the jet wake and intakes. Intake guards are usually fitted for starting-up and taxying, and brakes are sufficient to hold the aircraft without the aid of chocks.

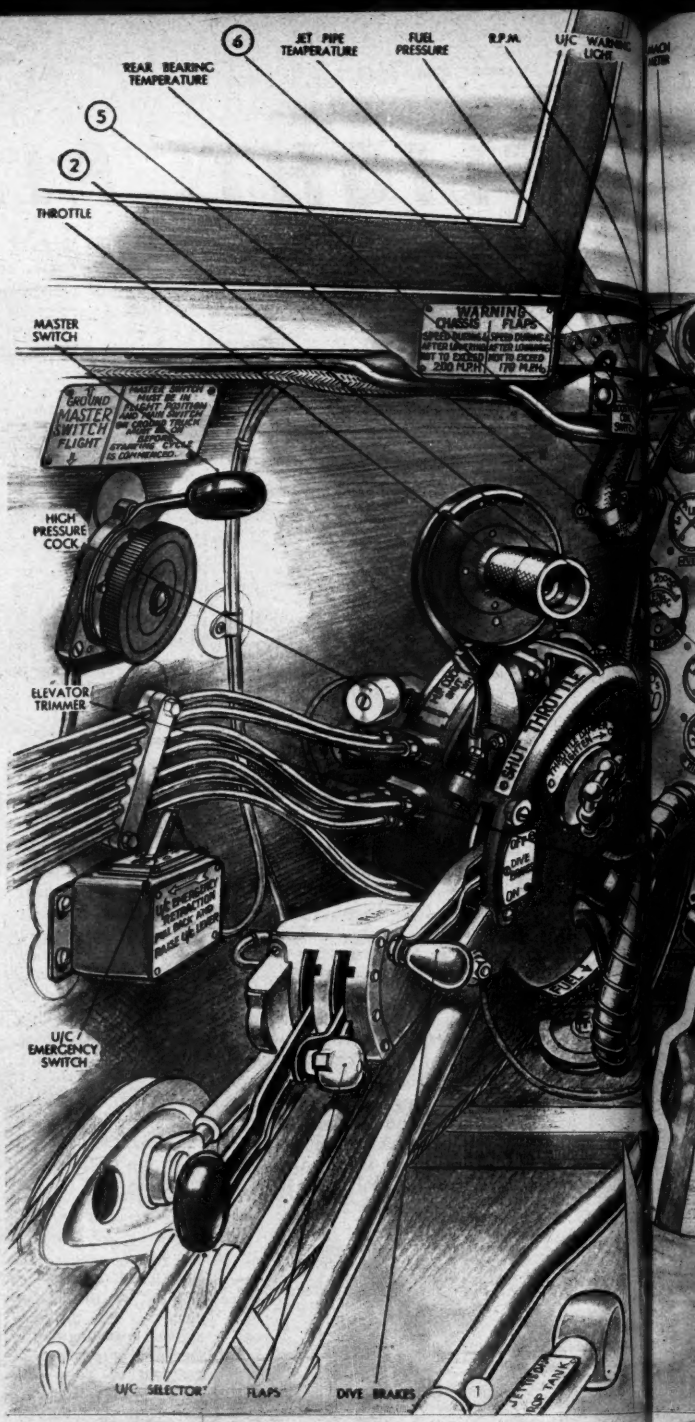
Starting the Goblin

With master switch moved to "flight" and throttle fully closed, I systematically turned-on the low-pressure fuel cock, equivalent to the fuel cocks on any other aircraft, then the high-pressure cock; both are on the engine control box on the port side. Next, turning to the starboard-side electrical group, I switched-on the interlinked starter and master switches, and finally pressed the starter button. Nothing happened. I waited for what seemed like minutes, but was, in fact, only a few seconds, and as I began to feel rather clueless and to look slightly nonplussed, Geoffrey Pike called to me to "wait for it." Almost at once there was a faint rumbling sound and a pronounced odour which reminded me of a rural cooking stove. Sitting tight, the characteristic Goblin whine slowly built-up to a crescendo until the revs reached the idling speed. During this starting procedure, with canopy open, my senses of hearing and smell had provided the only indication that the Goblin was running. The noise was not unduly loud and there was no sign of vibration or movement to indicate that the engine was a part of the Vampire.

Once the turbine is running, the interlinked switches are moved to "off," and the fuel booster pump is switched to "on." The R.I. compass is also switched-on. With gas turbines there are no magnetos, airscrews or supercharger gears to be checked, and no warming-up is required. This would prove an important feature when scrambling a squadron. The official pilots' instructions are brief and to the point: "Do not run-up the engine. This is unnecessary and wastes fuel."

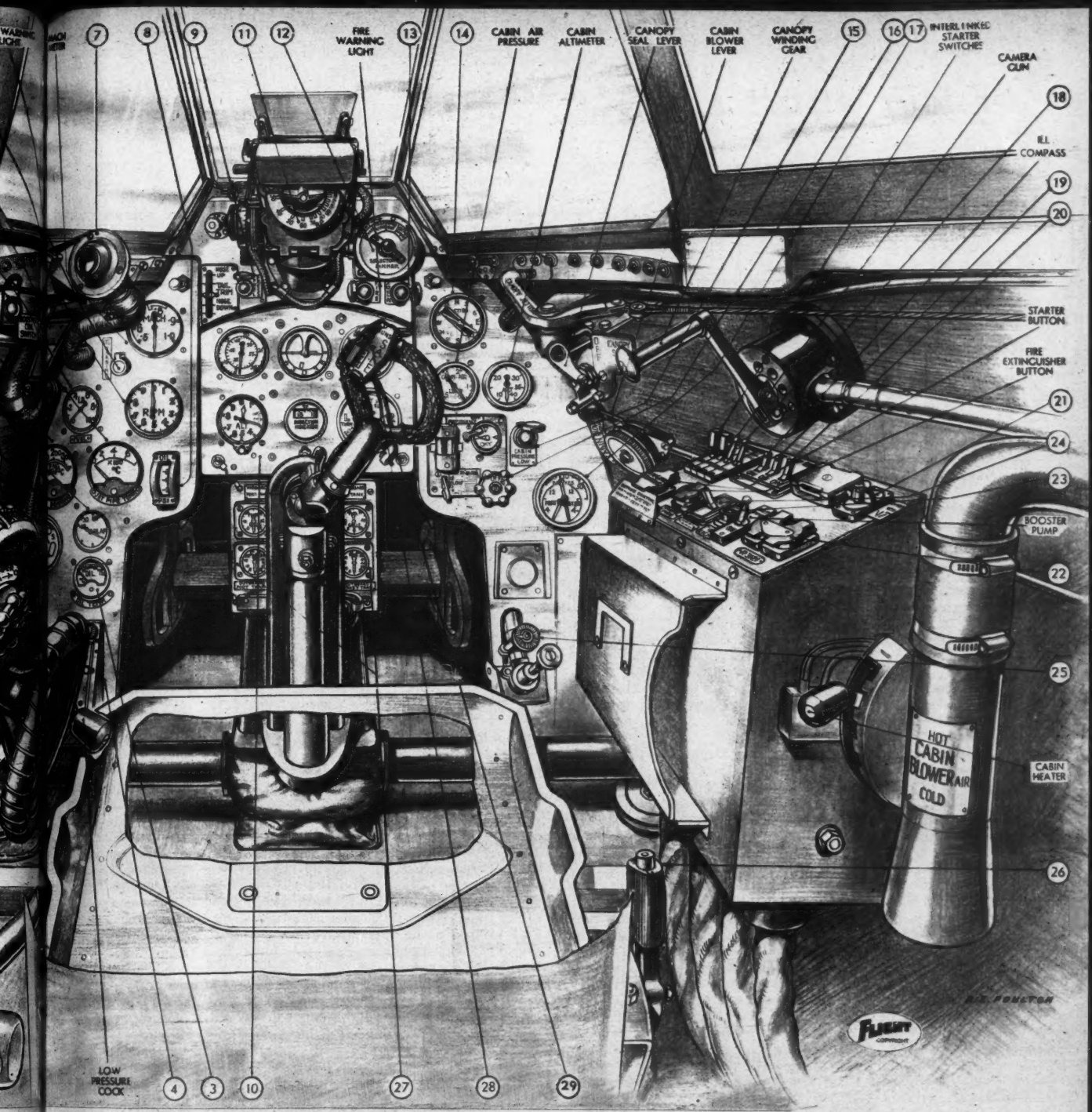
Although the enclosure is quite small and a gyro gunsight obstructs the view forward through the bullet-proof screen, the pilot's view for taxying is adequate. Rather gingerly I moved the throttle forward, but it was not until I had built up about 8,000 r.p.m. that the Vampire began to move forward on the grass to the accompaniment of a really healthy scream from the Goblin. Once moving, the throttle can be moved well back again to keep rolling straight ahead. Taxying was rather jerky at first because I moved slowly and did not judge to a nicety the power requirement for turning. The brakes are operated by a lever on the stick and differential use of rudder. The Vampire seems to prefer to stay straight, and, of course, there is no help from any slipstream on the rudders when a turn is being made. As with most tricycle types, it is easier to taxy fairly fast, and once out on the field or runway I got along well. The pronounced nod as the nose oleo compressed when brake was applied, proved rather disconcerting on first acquaintance.

Having lined the aircraft up on the runway, I closed, locked and sealed the canopy. The winding handle and



pressure seal lever are so arranged that the canopy cannot be moved when sealed without the handle tripping the seal lever. The seal itself is in the form of an inflatable element around the joints of the canopy. Apart from being air-tight it effectively excludes noise.

After completing the simple take-off check (T-Trim elevators neutral; F—Fuel cocks on and booster pump on; F—Flaps 30 deg. or "up," according to choice and runway), the throttle was slowly opened wide against the brakes, and I checked that the r.p.m. were about 10,000. I noticed also that the jet-pipe temperature was about 560 deg. C and the rear bearing temperature under 100 deg. C. The brakes will not quite hold a Vampire with Goblin II at full bore, and, on letting go, the machine surges forward without any sign of swing. The acceleration seemed most impressive between about 50 and 100



In this specially prepared drawing our artist, R. E. Poulton, has faithfully reproduced the cockpit layout of the standard de Havilland Vampire III. Controls and instruments which have special significance in connection with this description are annotated for immediate reference, while standard equipment and secondary instruments are numbered and referred to in the key below.

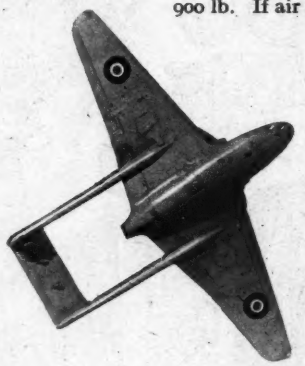
1. Hydraulic hand pump
2. U/C Lights
3. Oil Temperature
4. V.H.F. Control Box
5. Flap Indicator
6. Booster Coil
7. Cold Air
8. Oil Pressure
9. Fuel Pressure Warning
10. Standard Blind Flying Panel
11. Gyro Gun Sight (Range Control on Throttle)
12. Gun Sight Selector and Dimmer Control
13. Generator Warning
14. R.I. Compass
15. Cabin Pressure Warning Light
16. Oxygen Regulator
17. Brake Pressure
18. G.G.S. Switch
19. Pitot Head Heater
20. Navigation Lights
21. Landing Lights
22. Detonator Buttons
23. Identification Lights Key
24. Identification Lights
25. De-Icer Pump
26. Seat Adjustment
27. Fuel Contents Gauges
28. Gun Firing Button
29. Brake Lever

Detail of cockpit pressure seal.

'FLIGHT' PILOTS A JET . . .

m.p.h. At around 60 m.p.h. a slight stick-back movement lifted the nosewheel off the ground, and at 90 to 100 the Vampire (with 30 deg. flap and about ¼ fuel load) fairly popped off the ground in answer to a further small stick movement.

Reflecting on the first take-off, which was made in rather poor light and a rainstorm, I must confess to one short blank in my memory. Things happened quickly, and although I remember selecting wheels-up (their retraction is quickly confirmed by a pronounced thud and a momentary twinkle of red indicator lights), followed by flaps-up and throttling back, I was not conscious of flying the machine until I had reached about 800ft and the speed was building up to about 200 m.p.h.



Almost automatically I turned gently to port before making a check-up around the cockpit. I expected to read about 9,500 r.p.m. on the rev counter, which is of the two-needle sensitive altimeter type, but at first glance all the dial registered to me was about three minutes past six! I worked it out quickly enough, but since then two things have become apparent to me: one, that if a familiar dial is re-graduated for another purpose it may become confusing, and, two, that a small movement of a "jet" throttle produces (a) a relatively large change in r.p.m., and (b) if it is at the wide-open end, a very large change in power. These points are, of course, no discovery, but one has to fly and control an aircraft with a turbo-jet to appreciate them fully. The throttling-back movement, which I had made by force of habit when the wheels were up, had been quite small, but had, nevertheless, over-reduced revs and thrust.

Speed had increased to just over the 200 m.p.h. mark, and the height was only 1,500ft by the time I had worked things out and completed a down-wind leg, so opening up to a cruising r.p.m. of 8,700 with a very small throttle movement, I saw rather than felt the speed begin slowly to build up as I flew around to get the feel of things generally. Best climbing speed is about 260 m.p.h. and correct r.p.m. are 9,700, but wishing to gain height and still having a vague idea of rocket-like ascent and enormous thrust, and also because I had decided to take things easily for a start, I pulled up into a medium climb with speed and r.p.m. as they were, and was puzzled to see the speed drop off quite rapidly within a thousand-or-so feet.

Levelling out under the clouds at about 4,000ft I quickly analysed this manifestation, as it seemed, of jet perversity. A clear sky lie ahead of me, and so this time I carefully opened-up to 9,700 r.p.m., the correct climbing revs, and allowed the speed to build up to rather more than 260 m.p.h. Again I pulled up the nose, holding correct climbing speed and enjoyed the marvellous sensation of rising up past the edges of cloud layers at well over 4,000 ft/min, almost as if in a lift, and of seeing the altimeter needle counting off the thousands of feet like an elevator floor-indicator at the Rockefeller Centre. When I next fly a Vampire I shall have in my mind a picture of the Goblin's r.p.m./thrust curve—particularly the steep bit at the top. At high speed I shall also be more conscious of the effect of ram and the "95 per cent efficient, high-velocity ducted air intake."

In some ways I went up expecting too much, but in others I got more than I bargained for. Three thousand pounds of thrust cannot be expected to raise a 10,000-lb aircraft vertically, nor to accelerate it like a rocket, but it can and does provide a thrilling performance.

On reaching a little over 12,000ft I levelled off, as I was not wearing an oxygen mask, and throttled back to an engine cruising speed of 8,700 r.p.m., which gave around 320 m.p.h. indicated. At 10,000ft, 10,000 r.p.m. and 300 m.p.h., the Goblin II gives a fraction under 1,900 lb thrust, but at 8,000 r.p.m. and the same speed the thrust is only 900 lb. If air speed is increased to 500 m.p.h. these powers become approximately 1,920 lb and 840 lb. It is at about this speed that ram effect proves beneficial, and in the case of the Vampire installation, thrust, after falling off, begins to increase again with speed at about 480 m.p.h.

D.H. 100 VAMPIRE Mk III

Goblin II—3,000 lb Static Thrust

Span	40ft
Length	30ft 9in
Height	6ft 3in
Wing loading	45.8 lb/sq ft
Initial climb	4,350 ft/min
Max. speed	531 m.p.h.
Service ceiling	43,500ft
Still air range at 350 m.p.h.	590 miles S.L. 1,145 miles 30,000ft
Patrol duration	2.35 hr at 30,000ft
Full load take off to 50ft...	1,180 yd
Landing from 50ft (8,500lb)	1,100 yd
Max. all-up weight ...	12,170 lb
Total fuel capacity ...	530 gallons

While still getting accustomed to the feel of the Vampire at higher altitude and speed, I tried the cockpit pressurizing equipment, which is operated by one small tap. The effect was instantaneous, and the gauge showed about 1 lb differential pressure at this height. The compressor fan could be heard plainly above the whistling of the wind. I also tested the effect of the cockpit seal and was surprised at the tremendous increase in noise when "unsealed." Even so, the turbine could scarcely be heard and was so smooth in operation that it could not be felt. In fact, one of my outstanding impressions was of the incredible silence as I cruised along high above the cloud. The sensation suggested skating through space in a transparent egg. The inability to see any of the Vampire except, with an effort, its wingtips, and the magnificent view afforded downwards to the sides, and all around at eye level and above, emphasized this illusion. Extraordinary as it may seem, there was a suggestion also of the balloon there: no apparent motion, no visible means of support, and silence except for the wind.

Accurate visual flying was at first something of a problem. There is no prominent nose or wingtip to hold on the horizon, and none of the ordinary noises to tell of the

The Vampire offers spirited performance at high speed but docility and positive obedience to control for approach and landing.

'Flight' Pilots a Jet . . . . .

engine pulling hard or idling. Even the increasing wind howl, customary in a dive, was absent at all but the higher speeds. Instruments alone told of 500 feet lost or gained, or speed increased or decreased by 50 m.p.h.

After being airborne for only fifteen minutes my position was west of Dunstable, but because Hatfield was still under black cloud and rain I elected to take two or three minutes off to fly back over the field to indicate that I was not lost. V.H.F. was fitted, but the crystals were missing.

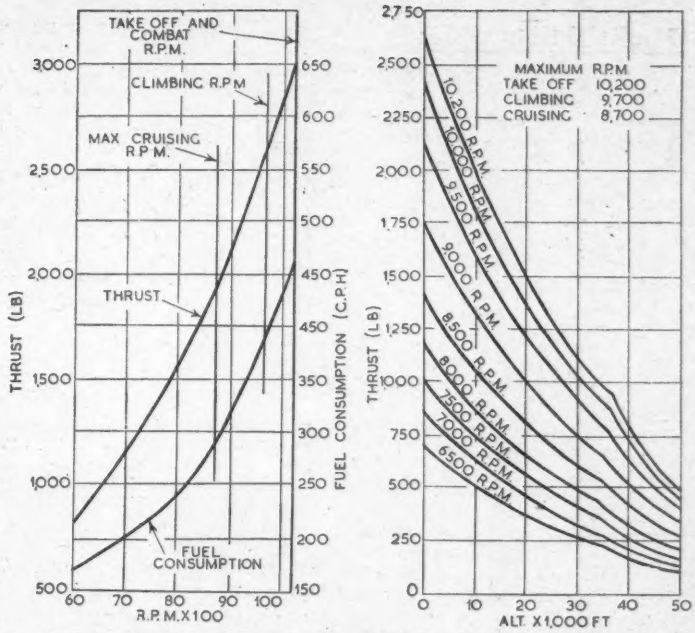
Machmeter in Use

At 12,000ft I put the Vampire into a shallow dive and watched the speed build up rapidly to about 425 m.p.h. indicated. For the first time I sensed that there was a real power unit behind me. No noise or vibration were apparent but rather the suggestion of passing through the first door on the way to a distant electric power house. I had no experience of calculating true air speeds on a diving Vampire, so transferred my attention to the Machmeter at this point and saw it rise to 0.55, then 0.6, and on arrival over Hatfield at 1,200ft, about 0.65. Maintaining speed I completed an exhilarating vertical turn round the field, and in quick time was making a thrilling rocket-like full-throttle zoom over Harpenden on my way back towards the open patch of sky. Swallowing hard and frequently on the way up in order to make my ears "ping" I did not bother with cabin pressure. The cockpit temperature was comfortably warm, although I was clad only in a linen flying suit over ordinary clothing.

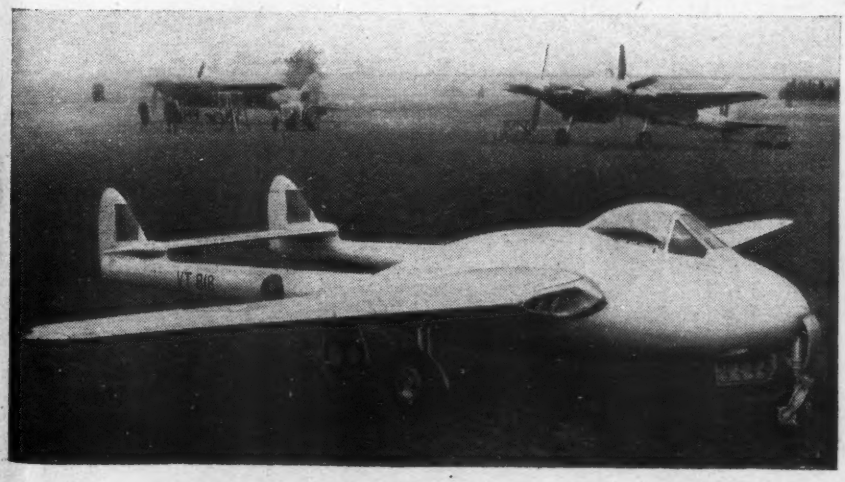
It was at this point that I began to appreciate to the full the speed of the Vampire and incidentally to feel the physical strain of flying it. At one time I found myself a few thousand feet above a lower layer of cloud and decided to fly down through a small gap in it to confirm my position. Not only did my speed build up alarmingly, although the engine was throttled back, but I almost overshot the hole, and finally thought better of the idea and pulled out along the cloud tops, "redding" myself out in the process, and climbing several thousand feet while slowing down. I made another pass at the hole and got through it, but learned from this brief experience that speeds build up very quickly in the dive when the airframe is clean and airscrew drag absent. It also confirmed the fact that jet aircraft must have room to manœuvre.

On regaining altitude I tried some aerobatics. The first two loops were failures, for not only did I start too slowly (330 m.p.h.), thinking to take up less space, but I spared myself g by not pulling up quickly enough at first and was also over-anxious to pull her over on top. The result was that my speed dropped off, and I flicked smartly out from the inverted position. Perhaps I have a two-boom complex, as I used to do the same thing on a Lightning. The Vampire gives warning of a stall with slight buffeting and recovers quickly and comfortably. Although I did not attempt one, the spin recovery is, I am told, quite normal. A third loop, starting at 400 m.p.h. and carefully flown round—something which calls for patience rather than skill—came off quite nicely. Rolls, and rolls off the top, presented no difficulty and were most stimulating and morale-improving. The rate of roll was not as great as I had expected, but a slow roll was in any case a more pleasing manœuvre. I omitted to try an upward roll but did try using dive brakes under various circumstances, such as on the pull-out from a loop. The retarding effect does not feel very great, but the effect as shown by the A.S.I. is considerable.

Not being in training for such flying, I felt the strain of the g experienced in turns and pull-outs, and it was this, to a greater extent than I had expected, that, for me, limited the manœuvrability of the Vampire. Looking round on turns made my head loll over and my neck ache. My stomach walls also registered the strain. I imagine a diver must have similar sensations in his legs when, on land, he



(Left). Performance and consumption curves for the Series II Goblin at sea level and zero forward speed. (Right). Curves indicating thrust variation with change of altitude and engine speed for the Goblin II at 300 m.p.h.—average cruising speed of the Vampire. Thrust h.p.=Thrust × 0.8 at this speed.

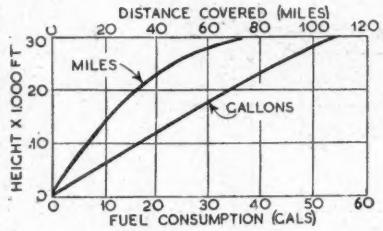


Ready for delivery to the R.A.F., this new D.H. Vampire III fighter is the actual aircraft featured in this narrative. In the background are two of its illustrious fan driven predecessors, the Mosquito and Hornet.

'Flight' Pilots a Jet . . . . .

takes a step or two with pounds of lead holding him down.

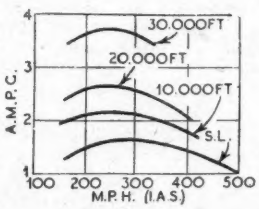
The Vampire does not carry a simple magnetic compass; interference from the turbine would be excessive if it were mounted anywhere in the cockpit. The R.I. (Remote Indicator) compass master unit is mounted as far from the engine as possible, 3ft from the tip in the starboard wing, and it did its job well. I caught the directional gyro spinning on one or two occasions, but that was to be expected.



Graphic indication of distance covered and fuel used as the Vampire climbs to 30,000ft.

As light was failing I decided to dive home, and in spite of the violent bumps, again thoroughly enjoyed the sensation of high speed when I got nearer to the ground. The highest Mach number reading was 0.69; the limit permitted is 0.75.

To get accustomed to the circuit height, and to reduce speed, I made two circuits, and then commenced an approach to land. Speed was still about 280 m.p.h., so, throttling back to 5,500 r.p.m., I extended the dive brakes. The speed fell to 170 m.p.h. and, having commenced the down-wind leg, I dropped the wheels and selected 30 deg of flap. The wheels locked down with a resounding bump and air passing over the nosewheel produced a loud rumbling. There is no warning horn for the wheels, but an extra-bright red warning light is fitted instead. The emergency switch operates the locks and is only used with the hand pump or on an overshoot landing to fold the wheels—an action not otherwise possible if there is weight on them. Other aircraft were on the circuit, so as a precaution I switched on lights.

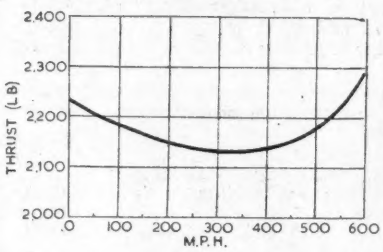


Variation of air miles per gallon with height and air speed for the Vampire.

It became necessary at this stage to use some more thrust, the air speed having fallen to 150 m.p.h. There was a strong wind blowing, so I retracted the air brakes, which were producing a certain amount of airframe vibration at this speed, and commenced a wide turn-in at 140 m.p.h. I selected full flap at 500 feet and found the speed dropped slowly off with turbine r.p.m. of around 6,000. It was necessary to hold the stick well forward to keep the nose down and the speed at 130 m.p.h. I started to level-out at about 110 m.p.h.—a little on the fast side for the weight—then closed the throttle and floated well down the runway before touching-down in conventional tail-down attitude and rocking forward on to the nosewheel.

Until the moment of touch-down the Vampire remained most responsive, and the elevators in particular were very sensitive on hold-off. This I have confirmed on subsequent circuits, when I learned to like the approach, landing and ground-handling characteristics of the Vampire very well.

A feature of interest is the relatively small change of fore-and-aft trim experienced under all normal conditions of flight. I did not fly the Vampire at maximum speed, maximum all-up weight or at very high altitude, but, except for the final approach, when the nose must be held down, and in a dive when there is also a slight tail-down tendency, there is no need to move the elevator trimmer from the neutral position. Lowering of wheels, dive brakes and up to 40 deg of flap cause no appreciable change of trim. What changes there are tend to cancel each other out on the approach. (Wheels down—nose up. Flaps down—nose down.)

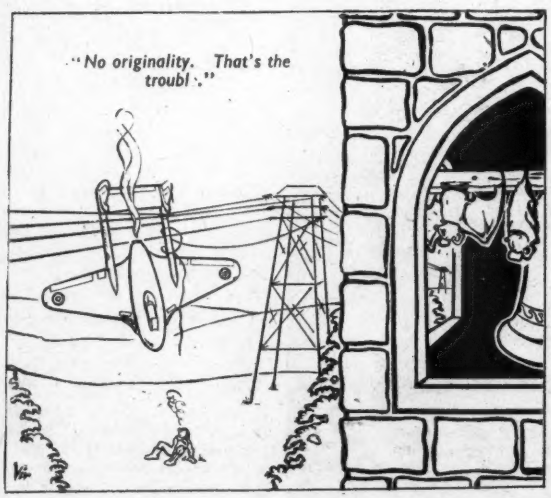


Estimated thrust of Goblin II at 10,200 r.p.m. in flight at 10,000ft. Although gross thrust increases with forward speed, net thrust falls, recovers, then finally exceeds the initial value. This is due to the deduction of intake drag from gross engine thrust.

On return to the tarmac I had to think hard for a moment how to stop the engine; no idle cut-outs, no switches. All that one does, in fact, is to turn off the high-pressure fuel cock and the Goblin cuts instantly. Booster pump, master switch, compass, etc., are of course switched off before leaving the aircraft.

In future I shall watch displays of low aerobatics and high-speed flight by pilots of turbo-jet aircraft with more understanding and even greater admiration. The manœuvres themselves are not particularly difficult to execute; the skill is chiefly in the timing and judgment of position. Moreover, the physical strain imposed on even experienced pilots should not be underestimated.

Piloting a jet aircraft has confirmed one opinion I had formed after flying as passenger in the Lancastrian jet test beds, that few, if any, having flown in a jet-propelled transport, will wish to revert to the noise, vibration and attendant fatigue of an airscrew-propelled piston-engined aircraft.

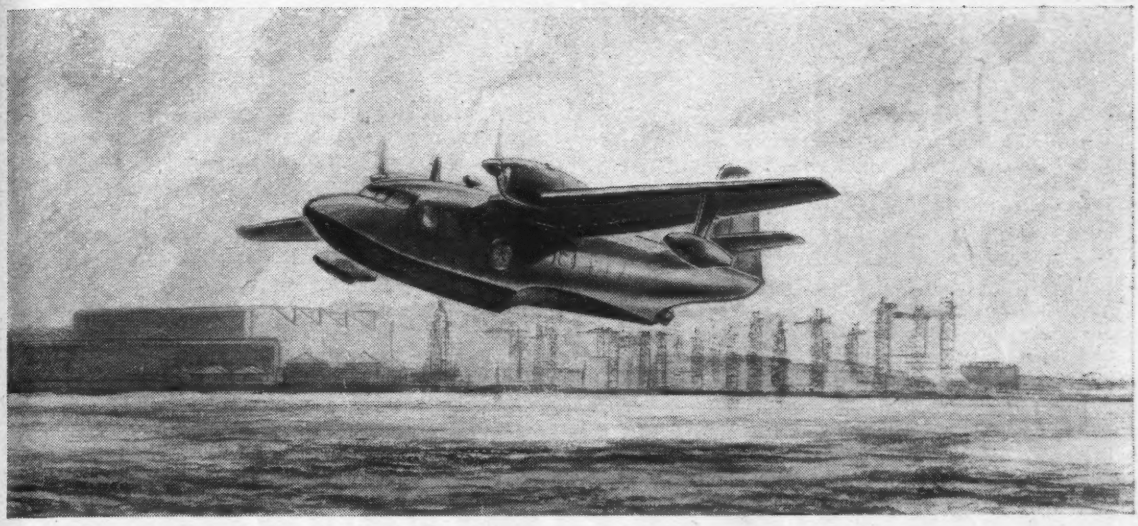


CONCORDIA PRODUCTION SUSPENDED

FOLLOWING the first stage of a programme of demonstration flights on the Continent and in Africa and India, the directors of Cunliffe-Owen Aircraft, Ltd., have decided that production of the Concordia must be suspended. This regrettable decision has resulted chiefly from the effect of the present world situation. No more unfortunate circumstances could have arisen for an export demonstration tour in view of the existing unrest and the import and currency restrictions.

It had been estimated that orders for 60 or 70 aircraft would have to be obtained to make production of this twin-engined feederline aircraft an economical proposition. Unfortunately these were not forthcoming, largely because of lack of international purchasing facilities for this class of aircraft.

Work on the two large helicopters which are being built in conjunction with the Cierva Autogiro Co., Ltd., will not be interrupted; in fact it will probably be accelerated, and the machines may be completed rather sooner than was expected.



Our artist's impression of the Sealand in flight over the Belfast lough. In the background are depicted the huge gantries of the Harland and Wolff shipyard and on the left the Company's flight and assembly hangars on the edge of Belfast Airport.

Sealand Prototype Completed

Short's New 5/8 Seat Amphibian Prepared for Flight Trials : Two Gipsy Queen Engines

THE Short Sealand flying-boat amphibian, the prototype of which has been built at Short's Belfast factory, has recently been completed and taken from the construction shop to the flight sheds. It is expected to make its first flight during the coming week with S/L. John Booth at the controls.

Gipsy Queen 70 engines are to be fitted to two prototypes and to an initial series of twelve production Sealands. In addition a Leonides-powered prototype is to be built. The first production machine is due to be completed in the Spring of 1948.

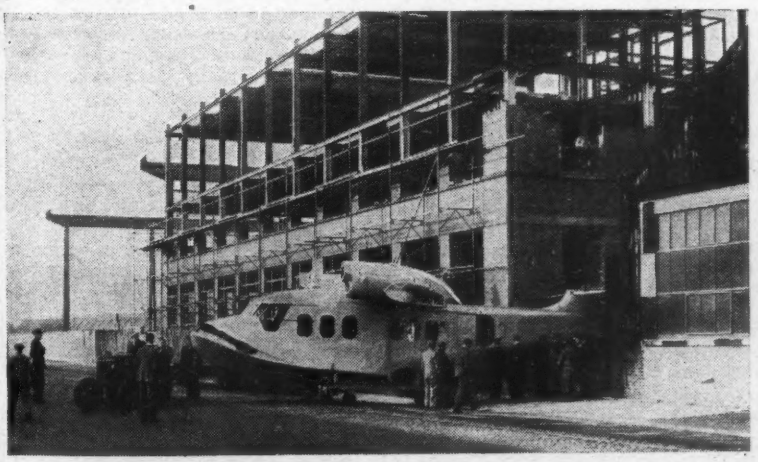
The design of the Sealand has been the joint work of Short's Rochester and Belfast design staff, but the construction has been carried out entirely in Northern Ireland.

Five passengers are provided for in the standard cabin layout, but this can be increased to a maximum of eight if desired. The maximum payload is 1,400lb and the Sealand is intended primarily for short-haul work over coastal routes.

Payloads as Flying Boat

The use of the Sealand primarily or entirely as a flying boat has been foreseen, and the amphibian can be converted into a flying boat by the removal of the undercarriage and the fitting of metal cover plates over the wheel wells. This operation is very simple and involves only the removal of two large bolts on each leg and the severing of electrical and pneumatic connections. The removal of the main undercarriage units and tail wheel increases the payload of the standard version of the Sealand to 1,500lb. Should it be required, a Sealand flying boat can be ordered in which the whole undercarriage structure has been eliminated. The result is a freighter flying boat with a useful load, in addition to 400lb of special equipment, of 1,288lb. A special cradle is provided for beaching the plain flying boat. Finally, provision has been made for the fitting of skis so that the aircraft can use snow or smooth ice as an airfield.

The most economical cruising speed at full load will be 127 m.p.h. (110 kt.) and the high cruising speed is calculated at 177 m.p.h. (155 kt.). Maximum speed at 6,200ft will be 188 m.p.h. (163.5 kt.). A complete illustrated description of the Sealand will appear in our next issue.



The movement from construction shop to hangar of the prototype Sealand with tail surfaces, wings and airscrews removed was a major operation. The building in the background is the new drawing office.

Alpine Air Force

Set against the grandeur which is Switzerland is a D-3801 army-support fighter. Though dating from 1939 the type still renders good service.

Emphasis on Army Support : Special Vampire Variant

By ROY CROSS

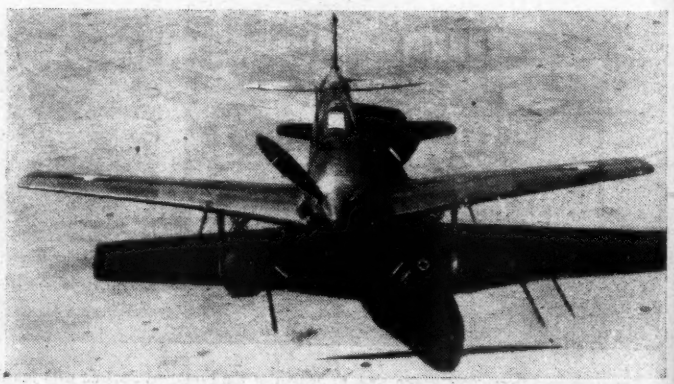
STRICTLY limited by both geographical and economic factors, Switzerland's Air Force is nevertheless an efficient fighting force which insists on the most modern material and training for its personnel. The Swiss terrain is rugged and mountainous for the most part, and the location of new airfields is a matter of some difficulty, although there are already several airfields up in the Alps, which, incidentally, offer bomb-proof protection for both aircraft and crews in hangars, and quarters hewn out of the solid rock. Flying and fighting in the small valleys of the national *réduit*, and the general topographical and atmospheric difficulties met with by Alpine flyers, necessitate special training for aircrews and, to a lesser degree, careful selection of equipment.

The role of the Air Force is a tactical one, co-operation with the Swiss Army being the primary duty. Thus the flying equipment, with the exception of training and liaison types, falls into two categories, namely, ground-attack and multi-purpose. Those machines in the first category are the several types of fighter in service, while general-purpose duties are undertaken by the Swiss C-3603 and C-3604 two-seaters.

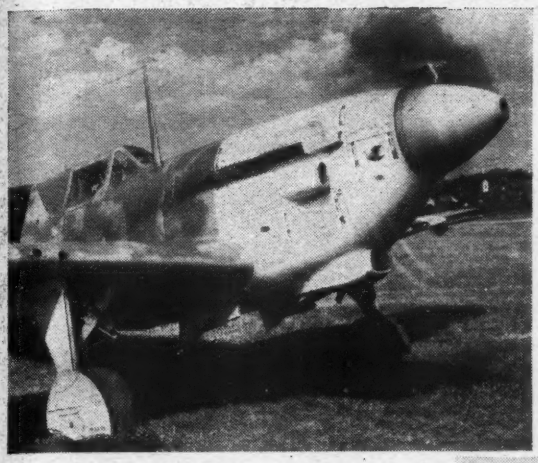
Present fighter (or ground-attack) equipment is standardized on the de Havilland Vampire, the D-3801 (Morane M.S.406), and the Swiss D-3802, although the airscrew-driven fighters are due to be replaced eventually by jet types—probably Vampire Is and VIs. Until recently various models of the Me 109, including the G version, were also in first-line use.

The D-3801 will be easily recognized as a higher-powered 1943 version of the 1939 D-3800, or Morane M.S.406. The engine is a 1,000 h.p. Saurer/SLM-Hispano-Suiza 12 Y 51 incorporating a 20 mm Hispano cannon firing through the airscrew hub. Two wing machine-guns, and two 50 kg bombs, or rockets, complete the armament. Maximum speed is about 325 m.p.h. at best operating height. The time to 30,000ft is 15.6 min., and service ceiling 35,400ft.

A much less familiar outline is presented by the recently divulged D-3802 close-support fighter. This machine seems to be of purely Swiss design, although passing likenesses to several wartime fighters will be discerned; for example, the undercarriage appears identical to that of the Morane M.S.406. Apart from this, however, there is practically no similarity at all. Two versions of the D-3802 exist, both powered by the 1,250 h.p. Saurer/Hispano-Suiza YS2 mounting the usual 20 mm Hispano cannon. One model has additional armament of two machine-guns in each wing, while the other has clipped wing tips, and two cannon replacing the four small wing guns. Data for the latter version are: Span, 32.8ft; length, 30.5ft; loaded weight, 7,716 lb.; wing loading, 40.3 lb sq ft; maximum speed at best operating height, 391 m.p.h.; time to 30,000ft, 12.5 min. Rockets, or four 50 kg bombs, or two 200 kg bombs, may be carried. The YS2 motor drives a four-bladed Escher-Wyss airscrew with "paddle" blades and reversible pitch mechanism, specially developed for use



This view shows how the second version of the D-3802 has clipped wings and outboard Oerlikon cannon.



Details of the engine installation, radiators and gun positions in the D-3802.

A Swiss-built military trainer—the Pilatus PE-2. Other trainers in use are the Me 108, Bucker Jungmann and Jungmeister

Alpine Air Force . . . . .

under the unusual flying conditions obtaining in Switzerland.

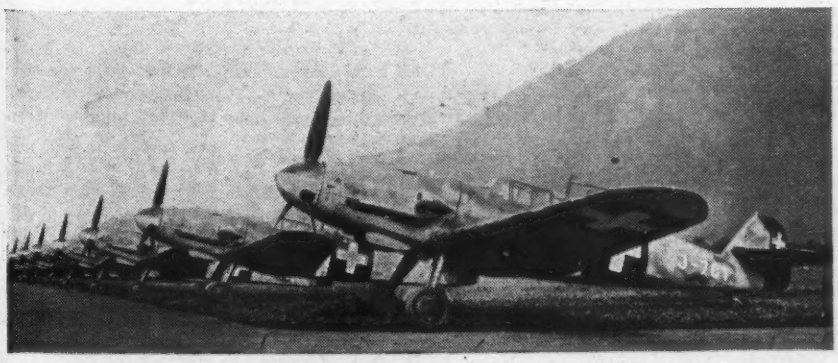
The Swiss have not disclosed the number of Vampires on order, but the total is probably between 75 and 100 machines. The first four acquired were standard Mk. Is with the long-range wing and 100-gal. wing drop tanks. Deliveries began on July 27th, 1946, and the second aircraft, piloted by John Cunningham, made the 475 miles to Geneva in 71 minutes on July 29th, 1946. The majority of the order will probably be filled by the Vampire VI, a special Swiss ground-track version of the R.A.F. Mk. V. The Mk. VI has a Goblin III engine giving an extra 300 lb thrust compared with the 3,000 lb. thrust of the Vampire I's Goblin II. The wing is strengthened and clipped to accommodate heavier armament loads, and a new undercarriage takes care of the increase in all-up weight. As with the Sea Vampire XX, the wing clipping is not dictated by the possibility of structural weakness so much as to forestall any trouble whatsoever before it starts.

Maid-of-all-work of the Swiss Air Force, the C-3603 is unusual among single-engined aircraft in having twin fins and rudders.

Multi-Purpose Two Seaters

The design of the C-3603/4 two-seaters has its roots in the C-36 of 1939, but the latest version, the C-3604, is still quite suitable for its particular tactical duties of reconnaissance and general ground support. As with the D-3802, power is stepped-up to 1,250 h.p. and the very commendable top speed of 348 m.p.h. is claimed. Armament is very heavy, and apart from the YS2 *moteur-canon* consists of two 20 mm cannon and two machine-guns in the wings, and two machine-guns on a free mounting in the rear cockpit, plus various combinations of bombs or rockets. Loaded weight is 9,480 lb and time to 30,000ft, 14.8 min.

The Air Regiments of the Swiss Air Force are backed by a competent Air Defence Warning Service and several anti-aircraft formations, the whole being knit into a small but highly organized and effective force. Since no heavy aircraft are operated, aircrews come into either pilot or observer categories. The three squadrons of the Training Group use the Pilatus PE-2, Bucker Jungmann and Jungmeister, and the Me 108 Taifun; the latter type and the Fi 156 Storch are employed on general liaison and communication duties. Possibly, the Me 109s and D-3800s formerly in first-line service are retained as reserve aircraft or operational trainers.



Messerschmitt Me 109Gs, as used by the Luftwaffe in the later war years, now serve as advanced trainers in the Swiss Air Force.

CIVIL AVIATION NEWS

"POLAR BEAR": The Norwegian Airlines Sandringham Mk VI "Kvitbjörn," taking off from Belfast Lough. The Company fly scheduled services from Stavanger along the coastal route as far north as Tromso. The service is suspended in the winter months, however, except for a daily flight between Bergen and Oslo.

International Aeradio Secure Contracts in the Far East : British Aircraft in Iraq : Fares Dispute in Australia

AIR TRANSPORTATION REPORT

IN a Paper prepared for delivery before the National Aviation Clinic in U.S.A., Sir William P. Hildred, Director General of the International Air Transportation Association, reported on the situation in international air transport.

Referring specifically to international airlines—those which provided scheduled services between two or more states and of which there were 69 members in I.A.T.A.—he said that operations were restricted by the existence of elaborate diplomatic arrangements and were hedged about by national and international regulations. The world, he said, was not yet fully organized for international private enterprise, and although it would not be surprising to find a substantial proportion of long-distance air traffic cruising at high speeds in the near future, the modern aircraft even now travelled faster than any other department of an airline. It was one thing, he said, to fly safely from one point to another, but it was another to obtain all the diplomatic clearances and organize refuelling and repair services and set up a booking system that would courteously handle four times more passengers than there were seats and to take the passenger, the crew and the aircraft through the maze of red tape which characterized international travel. He stated that the civil safety record was better than the overall record of military transport in the war. It had been made good, he said, because no airline ever felt that it was good enough and it was going to be progressively better.

Generally speaking, Sir William said, airways, airports and ground aids lagged many years behind the comparative development of aircraft. The problem of filling in the gap was not with the airlines since governments had accepted airports as their responsibility.

Referring to equipment, the Director General of I.A.T.A. said that the fleets of the international airlines comprised many aircraft left over from the war. Rates and schedules of many airlines had been built around such aircraft as the Dakota, but in many places it had been rendered obsolete by economics. An airline before the war, he said, would break even with only a 65 per cent payload in a Dakota but operating costs had risen to such an extent that a 90 per cent payload was now necessary. The airlines, he said, were looking for the twin-engined successor to the Dakota. One major difficulty was the fact that we had been unable to make costs stand still long enough for us to tell exactly where we were. The North Atlantic Traffic Conference, for instance, had worked out a cost analysis for the past year, but their report had contained so many factors that were temporary and variable that there was not as much as six months' experience which could be called normal operation.

Sir William said that it was the duty of airlines to serve the public pleasantly, courteously and with impassive confidence. The ground organization of the airlines was huge and immensely ramified, but they were being given the best training possible.

A.O.A. WINTER SCHEDULES

AMERICAN Overseas Airlines has made a normal seasonal reduction in the number of transatlantic flights from 24 to 15 a week. The new schedules include connections from America to Frankfurt, Amsterdam, Copenhagen, Helsinki, Oslo, Stockholm, Prestwick, London and Shannon but reduce the London-New York flights from 14 to 9 weekly. Last month the company started a new service between London and New York through Prestwick. All previous flights from Prestwick had stopped at Shannon and Gander but as part of the new schedule two Constellation flights each week, one on Monday and one on Thursday, will fly from London to Prestwick, Gander and New York.

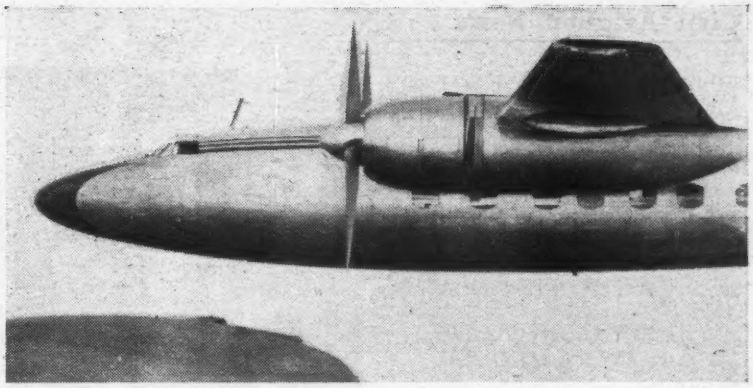
MARTIN 2-0-2s IN SERVICE

NORTH-WEST AIRLINES, who operate trans-America and trans-Canada services, will have their full number of ten Martin 2-0-2 40-passenger aircraft in service this month. They are replacing DC-3s. With their 245 m.p.h. cruising speed, the 2-0-2s will speed up schedules. Built-in loading steps swinging down from the tail reduce intermediate stop times, airline officials estimating this reduction at as high as 50 per cent. North-west is now flying one 2-0-2 trip daily between Chicago and Winnipeg, with three intermediate stops.

AMBASSADOR'S FORCED LANDING

OWING to a failure in the mechanism of the starboard leg of the prototype Ambassador, this aircraft was recently landed by Mr. G. B. S. Errington on the port leg only. It is

believed, after a preliminary examination, that some failure occurred in the "up"-locking mechanism or the hydraulic pipe lines of the starboard undercarriage leg, and it is probable that the leg then dropped and broke the "down" locks. The fracture drained off the hydraulic fluid, putting the flaps out of operation, but the aircraft, after an accurate and slow approach, was brought down maintaining adequate aileron control to keep the load as far as possible on the port leg. The Ambassador ran about 250 yds on this leg and the fuselage undersurface, until a nosewheel tyre burst and it slewed through 30 deg to starboard. Owing to the high-wing design, neither the starboard wing tip nor the engine nacelle touched, though the airscrew was damaged. There was damage to the below-floor structure of the fuselage, but the integral fuel tanks did not leak. The nearness of the fuselage to the ground naturally assisted the landing and prevented any violent reaction as the starboard wing stalled.



ELEGANT PROFILE : A close-up of the Ambassador taken whilst flying over Freshwater Bay, Isle of Wight. The prototype had an unfortunate mishap recently, but is expected to be out of commission for only a short while.

INTERNATIONAL AERADIO CONTRACTS

A FIVE-YEAR contract as agents for the Burmese government has been given to International Aeradio, Ltd. The government of Siam has also made a contract jointly with the British company and Aeronautical Radio, Inc., the counterpart in the U.S., to organize Siamese flying control and air communications, and discussions of detailed plans with India and Pakistan have been held. Cdr. Kemble and G/C. Scott-Farnie, executives of International Aeradio responsible for these developments, have now returned to this country after a 20,000-mile tour.

The airports in Burma which will be affected by the new arrangement are those at Mergui, Akyab and Mingaladon, and it is understood that apart from Burmese financial backing, expenses of operation will be recovered from air services using the facilities, though on a non-profit basis. In Siam, a local company may be formed, with participation by the British and the American firm and also civil aviation representatives. As soon as conditions permit, it is expected that both India and Pakistan will accept plans for communications and flying control based on those submitted by International Aeradio, and it is hoped that ultimately the new arrangements in all these four countries may help to bring about I.C.A.O. standards on the key routes to the Far East.

AIRLINES IN IRAQ

THREE Vickers Viking aircraft are to form part of the fleet operated by Iraqi Airways. So far their fleet consists of five de Havilland Rapides on hire from the Ministry of Supply and two D.C.3s on charter from B.O.A.C. The Rapides fly on the internal routes, while Dakotas operate from Baghdad to Lydda and Cairo, Teheran Damascus and Beirut. It is hoped that before the end of the year these aircraft will be replaced by three Vikings and three Doves, one each of which has already been delivered. When ready it is intended to start services between Baghdad and London via Nicosia, Athens, Rome and Marseilles, and to open new routes between Baghdad Ankara and Istanbul and between Baghdad, Basrah, Bahrein Sharjah and Karachi.

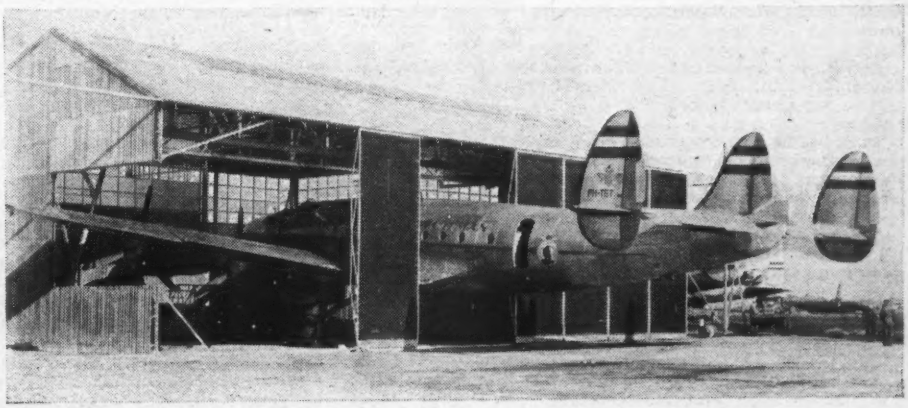
Iraqi Airways began to operate in January, 1946, as a department of the Iraqi State Railways under the Director-General, Major General H. C. Smith, C.B.E., M.C. B.O.A.C. were appointed Technical Advisers, and their staff has been engaged in training Iraqi personnel for flying, in engineering and in traffic duties. Good progress has already been made. One Iraqi pilot has gained his "B" licence and 2nd Class Navigator's Certificate, and others are to be sent to the United Kingdom for *ab initio* training. Three Iraqi radio officers are now in service, and several engineering trainees are undergoing preliminary training before being sent to the U.K. for their licences. Traffic personnel is now entirely Iraqi.

The expansion of operations in the course of a year is shown by the following figures: the number of miles flown on scheduled services increased from 55,730 in August 1946 to 63,624 in August 1947; the number of passengers carried from 502 to 1,094; charter mileage was 3,312—nearly three times as many as for the corresponding month last year; and freight and mail carried increased from 486 to 10,035kgs.

Lt.-Col. M. C. P. Mostert, O.B.E., has been acting as General Manager, with Col. Sabah Nuri as Deputy General Manager. Mr. B. W. Bampfylde is Commercial Adviser and the Commercial Manager-Designate, Sayid Kanaan al Askari, is now studying with B.O.A.C. in England. The Chief Pilot is Captain T. M. Walters, and Mr. J Drew is the Chief Engineer.

P.A.W.A.'s TWENTY YEARS

IN 1927, Pan-American Airways flew 90 miles, their first route being from Key West, Florida, to Havana. One of the original pilots, Capt. Basil Rowe, is still with the company and is claimed to have flown over 3½ million miles, but the 1927 figure of 3 aircraft and 25 employees has increased to in 1947, 128 aircraft and 19,000 employees. The services now fly over 108,681 miles. In twenty years the airline has flown 475 million lb of freight and 5,746 million passenger-miles.



NOSE HANGAR: In order to assist engine maintenance on Constellations during the winter months, special hangars have been built at Schiphol airport. The cutaway walls allow aircraft of large wing span to be housed without difficulty. K.L.M. operate the largest Constellation fleet in Europe, having 12 at present in service on the Transatlantic and Far Eastern routes, and five more on order.

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and its machines have flown 556 million miles. Among the aircraft designs sponsored by Pan American have been the Fokker F-7, the Sikorsky S-40 and the S-42, the Martin M-130 and the Boeing B-314 flying boat.

There were ceremonies to celebrate the 20th anniversary of America's entry into international air services with the Florida-Cuba service in 1927, and at the end of last month President Truman signed a scroll to be presented at Key West.

AUSTRALIAN FARES INCREASED

FARE increases of 20 per cent for all main Australian routes have now come into effect, these being the increases decided upon at the recent Melbourne conferences to cover higher wages and rising costs. In making this announcement, Mr. Drakeford, the Australian Minister for Civil Aviation, claimed that his country's fares were still lower than those of other countries, and he quoted these figures: U.S.A., 5.1 cents per passenger-mile; Canada, 6 cents; and Australia, at the new rates, about 4.7 cents. Freight rates may also rise correspondingly.

One company, however, Ansett Airways, refused to raise its fares, and was given a direction by the Civil Aviation Department that it must do so when its routes were in competition with those of Trans-Australia Airlines, the government owned airline. Mr. Ansett, managing director of the company, claimed that the Minister of Civil Aviation had no power to compel an increase, but only to approve fares and referred to the instruction as "bare-faced audacity." The Minister, in reply, has stated that "further action would be considered to make Ansetts fall into line with the other companies."

THE DC-6 INQUIRY

AS a result of the American C.A.A. Inquiry into the Douglas DC-6 accident at Bryce Canyon, Utah, on October 24th, modifications have been ordered "immediately" to this type of aircraft. All glass fibre insulation is to be removed as being unsatisfactory, not in itself but through hydraulic oil soaking, for though there was no evidence of this on the crashed aircraft, it happened on another DC-6 which flew to the scene. Besides the insulation change, airlines must before December 1st examine electrical systems; hydraulic systems (for leaks); fuel, oil, heating, ventilation, oxygen, alcohol and thermal de-icing systems. *Flight* understands that glass fibre insulation has already been removed by the various airlines as had already been recommended by the Douglas Corporation. The C.A.A. order exempts insulation attached to the underside of the cabin floor, above the cargo holds, but bans its use on the fuselage skin and below-floor bulkheads, adding that no reflection was intended on glass fibre insulation which was non-inflammable but when soaked could have a wick action. (Criticisms of the DC-6 by an American engineer were reported in *Flight* last week.)

COMFORT IN DEPTH: In this interior view of the first prototype Miles Marathon the layout incorporating 17 seats is shown, the square-section fuselage giving an impression of roominess. It is planned to make alterations in the furnishings of production aircraft, and an alternative of 18 seats will be available.

BREVITIES

On a flight to London, which left La Guardia airport on November 21st, American Overseas Airlines flew its 100,000th passenger across the Atlantic.

* * *

K.L.M. is re-routeing one of its twice-weekly South Atlantic services through Rome and Casablanca to provide direct connections from the Mediterranean to South America.

* * *

By the terms of a new agreement between K.L.M., Aer Lingus and B.E.A. there is to be inter-availability of tickets on the Dublin-Manchester-Amsterdam and London-Amsterdam routes.

* * *

A.R.B. has issued a second edition of Notice No. 13, November 20th, 1947, which deals with the inspection of Oxford and Consul airscrew blades for cracks.

* * *

In reply to a question in Parliament as to whether the specifications issued for a general utility airliner would affect the development of the Brabazon and Tudor aircraft, Mr. J. Freeman, for the Ministry of Supply, replied "None."

* * *

B.S.A.A. took delivery on November 20th of their Tudor IV, *Star Panther*. It was due to go into service on the Caribbean route to-day.

* * *

Presentation of British Civil Airworthiness requirements has been altered. Sub-sections will in future be issued together as complete sections, in booklets. At the end of 1948 it is likely that subscribers will be informed that they may pay a renewal rate which entitles them to receive all amendments for a stated period, probably five years

In Australia petrol rations for commercial flying other than that of regular airlines have been reduced from 50 to 45 hours a month, and for private flyers from 8 to 6 hours a month.

* * *

B.E.A.C. have cancelled their requirements for two Concordias and have reduced their order for Viking aircraft from 50 to 35. The Ministry of Supply is taking the necessary contract action.

* * *

Mr. Whitney Straight, managing director of B.O.A.C., has been appointed to the council of the Air Registration Board.

* * *

Air France has started three new services. They are London-Teheran; an extension of the New York-Paris route to Lydda in Palestine; and a Cairo service via Lydda. On the Teheran service DC-4s are used, leaving Heath Row at 9.55, reaching Baghdad the next day at 9.35 and Teheran at 11.55. Constellations are used on the other two routes, the Paris-Lydda stage being non-stop.

* * *

Warsaw-Paris and Warsaw-Stockholm services are now being run by LOT (Polskie Linie Lotnicze), and the Warsaw-Prague route is to be extended to Zurich, while preparations for a Balkan service are nearly complete. The route will be from Warsaw to Cairo via Belgrade, Budapest, Bucharest, Sofia and Lydda. Two of the five Languedoc four-engined aircraft which are on order have arrived from France.

* * *

A complete survey of the ground service preferences of air travellers is being conducted by the Air Transport Association in New York, and questionnaires are being submitted to

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145,000 passengers at airports in the metropolitan area. Points covered are the means of access to airports, the use of car parks and hotel facilities and baggage collection and delivery services.

* * *

To-morrow November 28th, Aer Lingus is to commence a Dublin-Rome service. Mr. Sean Lemass, Eire Vice-President, and Mr. Frank Aiken, Minister of Finance, will be on the first flight.

* * *

Another Latécoère 631 flying boat has been launched at St. Nazaire, the sixth of its class. Weighing 72 tons, with a wing span of 150 ft and carrying 46 passengers, the Latécoère will fly on Air France's South American route.

* * *

On November 20th a B.O.A.C. Hythe flying boat crashed near Newport, I.o.W., while on a positioning flight between Hythe and Poole. A member of the crew, First Officer G. K. Whitefoot, was killed, and the three others injured. There were no passengers.

* * *

The most probable cause of the Capital Airlines accident in the Blue Ridge Mountains, Virginia, last June 13th, was the pilot's decision to fly below the 3,000 ft minimum altitude in bad weather, reports the American C.A.B. A contributory cause was the faulty clearance given by a C.A.B. controller in Washington.

* * *

Britain and the United States have agreed in principle to the use by other nations of air bases operated by the U.S. on British territory in the Caribbean. If an agreement is signed it is expected that Canadian, Venezuelan and Cuban civil aircraft will be able to use these bases.

* * *

After what appeared to be a normal approach, a Trans-World Airways Constellation undershot the airfield at Newcastle, Delaware, on November 18th, the landing gear struck a ditch and the aircraft crashed and caught fire. It was on a training flight, and the crew of four and a C.A.A. inspector were killed.

* * *

Gibraltar Airways is now running a four-times-a-day service between Gibraltar and Tangiers with two DH 89s. Flight time is 30 minutes.

* * *

Australian internal air-mail rates may be reduced to 2½d, the same as that for surface mail.

* * *

The New Zealand National Airways Corporation, it is stated, intends to concentrate on air freight services during the coming year.

* * *

Swissair has been authorized by the C.A.B. in Washington to engage in air transport between Geneva, Zurich, Shannon, Santa Maria, Gander and New York, and a foreign air carrier permit has been issued. Swissair is the only airline authorized to exercise the rights granted to Switzerland under the agreement between that country and the U.S.A.

* * *

Under a new law, the Transport Board of New South Wales, Australia, has the power to impose taxes on airlines operating within the State of N.S.W. at the rate of 1d a passenger-mile and 3d a ton-mile. A similar tax is valid for road transport. The proceeds will be paid to the railways, who claim to be losing £1,000,000 a year to air operators.

* * *

Notice to Airmen No. 300 states that the November and December examinations for Navigator's Licences will be held in Scotland and at Hamble, Hampshire, in addition to other centres. It adds that candidates wishing to sit for the examination at either of these centres should endorse their application forms accordingly, it being assumed that candidates not so endorsing their forms wish to be examined in London. Further useful information is also included in the Notice. The Scottish December examinations are to be held at the Christian Institute, Bothwell Street, Glasgow.

FROM THE CLUBS

TEMPORARY responsibility for the administration and financing of the new Private Aviation Division of the Federation Aeronautique Internationale has been accepted by the Royal Aero Club. With headquarters at Londonderry House, Park Lane, London, the Division will assist private fliers of all member-countries of the Federation with general information, customs, regulations, air touring, the preparation of routes, the sale of air maps, and a travel bureau. Col. R. Preston, secretary-general of the Club, will be in charge of the new F.A.I. Division. It is more than probable that the existence of such fine premises as Londonderry House influenced the F.A.I. decision at the recent Geneva conference to delegate to Britain the management of the new division. A monthly news letter will be issued.

* * *

The South Coast Flying Club is among those which propose to continue with full staff, and believes that as the petrol cut for flying will not be serious during the winter months, when a reduction in hours would be normal, and as in addition the club's airfield is served by ten bus routes, it will be possible to carry on. Since the club was re-formed 17 months ago, 25 new "A" licences and 15 renewals have been obtained and 3,000 hours have been flown.

* * *

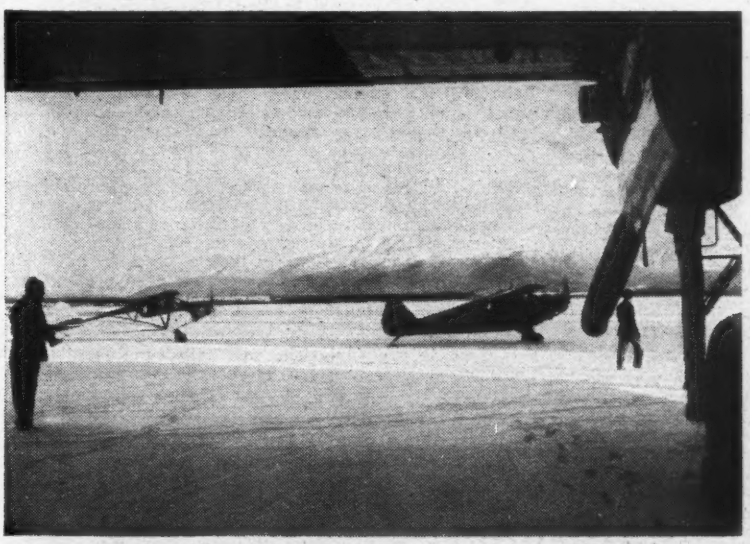
Another club not affected by difficulties of access to its airfield with the stopping of "basic" is the Southend Municipal Flying School, for it is on a bus route two miles from the town centre. Since its opening in March this year, 1,470 hours have been flown, 35 "A" licences obtained and six renewed. Aircraft comprise one Tiger Moth and three Auster Autocrats, two of which have navigation lights and take part in night flying, while two have carnets and last summer made several trips to the Continent.

* * *

At the National Centre for Air Sport at St. Auban-sur-Durance, France, two high-altitude glider flights were carried out on November 19th. M. Laforgue, an instructor at the Centre, reached 21,320 ft (6,500 metres) in a single-seater, and M. Jules Landi, an instructor from Nice, reached 20,008 ft (6,100 metres) in a two-seater.

* * *

The *Aries II* is to be the star attraction at a pageant being organized by New Zealand's Wellington Aero Club. The R.N.Z.A.F. has been making appearances at various club displays in New Zealand.



LAST LAP: George Truman and Clifford Evans, who have been flying round the world in Piper Cubs and were in this country last September, arrived on November 5th in North America. The two Cubs are here seen at Anchorage, Alaska.

CORRESPONDENCE

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers not necessarily for publication, must in all cases accompany letters.

SUBSIDIZED FLYING

The "Over Thirties"

IN your issue of November 20th F. S. Symondson writes to suggest that subsidized flying should only be enjoyed by those aged 30 or less.

I must protest that this seems not only unfair to those of us who are now keeping the clubs alive by paying the high rates at present necessary, but I would also contest his statement that older pilots would be useless in the event of war.

During the late war my instructor at E.F.T.S. was aged 50, and he did good work in initiating many of us into the mysteries of flight. I, myself, am now aged 37, and should another war break out, surely I could be of value either as an instructor, or in Transport Command, if my flying has, in the meanwhile, been kept up to scratch. D. W. N. CARTER.

AB INITIO MEDICALS

Statement of Health Should be Sufficient

I HEAR that there is a plan to make prospective pilots take medical examinations before starting their instruction. Surely this is unnecessary. Anything which is going to increase the cost, time and complication of getting an A licence is bound to discourage would-be private pilots.

If it is thought that there is a risk of people who are physically unfit finding themselves in charge of an aircraft, the answer, to say the least, is that this is most unlikely. There should be plenty of opportunity before a solo licence is granted for such people to be weeded out. It should be sufficient in the early stages for the pupil to fill in a form somewhat similar to that required for a driving licence for road vehicles. Poor vision and hearing, and inability to move joints or co-ordinate movements would quickly become apparent during instruction, and the pupil would have to be turned down anyway. If an unfit pilot did manage to get past the elementary stages and considered becoming a professional, he would be immediately faced with medicals for his more advanced licences. H. G. TUBE.

WOMEN PILOTS

Their Wonderful War Record Recalled

MAY I be permitted to make comment on the letter from L. Heather published in your issue of November 6th, regarding the formation of a volunteer reserve of women pilots? Whilst agreeing with the statement that there are more than enough male pilots available for this kind of work, I deplore and challenge the sentence: "As for women's work in the A.T.A., it could have been more efficiently done by men unfit for operational duties."

In the first winter of the war, the women pilots of A.T.A. ferried over 2,000 aircraft without a single accident; and during the Invasion period in the spring of 1944, they delivered from one base alone, more than 20 fighters a day: Typhoons, Tempests, Spitfires, etc., straight to the forward airfields.

Surely, this is a wonderful record, and one that merits the admiration and respect of every male pilot. I would remind your correspondent that women pilots constituted only about a fifth of the flying personnel of A.T.A.

Incidentally, I am unfit for operational duties myself, but would be the first to join a volunteer reserve of pilots for ferrying and communication duties. ALEC J. MATTHEWS.
Ex-Ferry Pilot, A.T.A.

HONOURING AN AMERICAN FRIEND

Proposed Presentation to Leslie Irvin

LESLIE IRVIN has proved himself to be a very good friend of the British, and his parachutes have saved many thousands of British lives. As he is a citizen of the United States, and apparently it is not possible for him to be rewarded as undoubtedly he would have been had he been British, some of his British colleagues have conceived the idea of making him a presentation as a token of esteem and appreciation. The scope of the idea widened because many of his friends and admirers wished to be associated with, and contribute to, the presentation. Consequently, subscriptions and support have now been received from, among others, members of the Royal Air Force, the Royal Naval Air Service, the Royal Air Force Benevolent Fund, the Royal Aeronautical Society, the Royal Aero Club, the Guild of Air Pilots and Navigators, the British Air Line Pilots Association and the Society of British Aircraft Constructors.

Since there may be readers of your journal who have not heard about the presentation but would like to be associated with it, this letter will serve as an intimation that contributions can be sent to the Hon. Sec., Major K. M. Beaumont, D.S.O., 380, Gresham House, Old Broad St., London, E.C.2.

Large contributions are not required. The idea is that the presentation should be associated with as many of Leslie Irvin's friends and admirers as possible.

A. G. LAMPLUGH, Chairman.
K. M. BEAUMONT, Honorary Secretary.
Independent Committee on the Future of Civil Aviation.

AUTOMATIC PILOTING

The Designer of S.E.P.1 Replies

MAY I as the designer of S.E.P.1 be permitted to intervene in the discussion started by "B" Licence Pilot?

Your correspondent seeks to convey the impression that there is complacency in official quarters in this country about the problems of all-weather flying schedules. He brings this charge against the very able team of Government research workers who are engaged on this problem (and who are debarred from defending themselves) without apparently being aware of the very substantial progress which they have already made and details of which, I hope, will soon be publicized.

As I see it, the problem which we all have to solve is to be able to operate the aircraft on schedule in conditions of low visibility. I can see no logic in suggesting that to do this the intelligent crew has to be replaced by tailor's dummies! What, then, is the significance of "B" Licence Pilot's trap phrase "without human control in the air or on the ground"?

In his second numbered comment on Mr. Morgan's letter, he again implies that S.E.P.1 is unsuitable for the purpose because it does not provide automatic pitch trim and altitude monitoring. This is surely special pleading. It is an open question whether automatic pitch trim is really required. With the advent of full power-operated controls, it becomes meaningless. With conventional controls and good aerodynamic design, e.g., the Liberator on which the A.12 has been demonstrated, it is unnecessary since the A.12 trim motor does not, in fact, move when the flaps and undercarriage are lowered and, at the worst, the responsibility for adjusting trim on the indications of a trim gauge is not arduous.

Nevertheless, because the question is an open one and because the design problem is not severe, we are making provision for the supply of an automatic trim motor as an optional addition, and this will be available before it is actually required. The altitude monitor is not required, or even applicable to the problem of taking-off and landing. It may be desirable if the aircraft is required to "stand-off" waiting its turn to land, but it is an essential part of the problem that the traffic should be so organized that these delays are eliminated. However, since the demand may become apparent we are making provision for this feature as well.

Finally, in answer to your correspondent's question "what is a safe automatic pilot?" I would state that it is one which will not, either due to foreseeable internal failure or due to weather conditions, apply sudden dangerous movements of the controls. It is not true to say that to keep the aircraft on the beam it has to make coarse control movements; this is wrapped up with the stability of the control. The provision of auxiliary safeguards which will detect when the autopilot has applied dangerous control movements and cut it out *after the event* is not equivalent to "failure-to-safety" design which prevents the dangerous movements even in the event of circuit failure. F. W. MEREDITH.

FORTHCOMING EVENTS

Nov. 29th.—Pathfinder Ball, Dorchester Hotel, Park Lane, London.
Dec. 4th.—Royal Aeronautical Society: "Problems Facing Civil Airline Operators." N. E. Rowe, C.B.E., B.Sc., D.I.C., F.R.Ae.S.
Dec. 6th.—Helicopter Association of Great Britain: "Some Aerodynamic Problems of the Helicopter." H. B. Squire.
Dec. 7th.—Royal Institution of Gt. Britain: "The Advent of the Aircraft Gas Turbine." A. Cdre. F. Whittle, C.B.E., M.A., F.R.Ae.S., Hon. M.I.Mech.E.
Dec. 12th.—R.Ae.S. (Graduate and Student). "Aircraft Design from the Airline Point of View." Christopher Dykes, A.F.R.Ae.S.

MALAYAN VISTA: A pair of Spitfires seen against typical landscape and cloud formations in the Singapore area. A squadron of Meteor IVs will eventually be based at Singapore.

Airfield Defence

EXPERIMENTS have been in progress at Shawbury with peregrine falcons to discourage flocks of birds from assembling on the airfield. The results have been encouraging, which is good news in view of the fact that damage attributable to birds to the tune of £20,000 was sustained by R.A.F. aircraft last year.

Recruiting

DURING the first nine months of this year, 47,363 regular recruits joined the R.A.F. Though lower than desired, this figure represents a better entry than during the first eight months of 1939.

Signals Appointments

TWO important appointments in the Technical (Signals) branch of the Royal Air Force will take effect in the near future. Air Commodore Eric Hardy Richardson, who has been Director of Radio at the Air Ministry since August, 1946, is to become Director of Signals on January 1 next, and Air Commodore Leslie Dalton-Morris, whom he will succeed, has been appointed Commandant of the Central Signals Establishment at Watton, Norfolk, from January 5, 1948.

Both the Director of Signals and the Director of Radio come under the Director-General of Signals, the former being responsible for the signals policy, planning and organization to meet Air Staff requirements, and the latter for the technical direction of the signals services of the Air Force, including the co-ordination of ground and airborne radio facilities. The Director of Signals is also responsible for the signals security organization and the co-ordination of R.A.F. signals policy with the Ministry of Civil Aviation.

Royal Air Force and Naval Aviation News and Announcements

The Central Signals Establishment trains operating crews for all ground control approach installations, and provides flying facilities for the calibration and air testing of ground radar and radio navigational aids in the United Kingdom and overseas.

R.A.F. at the Wedding

THE Royal wedding route on both sides of Whitehall between Downing Street and the Houses of Parliament was lined by the R.A.F. Two hundred airmen of Technical Training Command faced each other across the road from a point north of Downing Street to the beginning of Parliament Street. The remainder of the route as far as the Houses of Parliament was lined by forty cadets from the R.A.F. College, Cranwell. All wore service dress with great-

SOUTHBOUND V.I.P.: Field Marshal Viscount Montgomery of Alamein greets the crew of his aircraft at Bassingbourne, Cambs., prior to leaving this country on November 13th for South Africa. He will discuss defence problems with Service chiefs of the Union.

Service Aviation . . . . .

coats and white ceremonial belts, and the cadets wore their familiar white cap bands. Opposite Downing Street music was played by the Central Band of the R.A.F.

As a present for Princess Elizabeth the R.A.F. bought a grand piano. It is a drawing room grand of a well-known make in an ebonised case. A few weeks ago, all ranks were invited to contribute towards a present—not more than two shillings and sixpence for officers, or sixpence for airmen and airwomen. Princess Elizabeth was asked what she would like bought for her particular use out of the Services gift and she chose the grand piano. The balance of the gift has been sent to the Princess.

Croydon A.T.C. Headquarters

MARSHAL OF THE ROYAL AIR FORCE, THE LORD TEDDER, opened the new headquarters of No. 1924 Squadron, A.T.C., at The Vale, Shirley, on November 15th. Lord Tedder, who is a Freeman of the Borough of Croydon, was received by the Mayor (Councillor E. W. Turner, J.P.), the Town Clerk, Lt. Col. D. R. Rees-Williams, M.P., Alderman George Lewin, J.P. (chairman, Croydon A.T.C. Committee), R. A. Ebbut Esq., J.P. (vice-chairman, Croydon A.T.C. Committee) and F/L. W. E. H. Caddy (Officer Commanding Parade).

Spitfires from Nos. 615 (County of Surrey) and No. 600 (County of London) Squadrons, Auxiliary Air Force, flew past at low level and Lord Tedder inspected an A.T.C. Guard of Honour. In his address, Lord Tedder, who walked with the aid of a stick, following a knee injury in Somaliland, emphasized the importance of the A.T.C.'s responsibilities. John Gordon, Esq., proposed a vote of thanks.

Later there was a march-past of squadrons before Lord Tedder, the civic dignitaries, A.V-M. Sir Alan Lees (A.O.C.-in-C., Reserve Command) and A/Cdre. Sir Harry Broadhurst (A.O.C. No. 61 Group). The new headquarters at Shirley are claimed to be the finest so far erected for the A.T.C.

***MEETING THE METEOR:** General Salih Omurtak, Chief of the Turkish General Staff, and officers of the Turkish Military Mission, inspect a Meteor III at Tangmere. Reference to their visit is made on this page. Air Vice-Marshal S. D. Macdonald, A.O.C. No. 11 Group, is seen explaining a point.*

Turkish Visitors at Tangmere

ON the morning of November 14th, Air Vice-Marshal S. D. Macdonald, C.B.E., D.F.C., A.O.C. No. 11 Group, and W/C. G. S. A. Parnaby, O.B.E., officer commanding R.A.F. Station, Tangmere, received General Salih Omurtak, Chief of the Turkish General Staff, at Tangmere. The General was accompanied by the following members of the Turkish Military Mission: Major General F. Ucaner, Major General Saim Orhon, Rear Admiral N. Ozdeniz, Brigadier R. Erdelhum, Colonel H. Ataman, Major T. Perin, Major E. Dirvana, Lt. Colonel C. Sancak, Major N. Akyildiz, and Colonel A. Sinik. After inspecting a guard of honour he moved to the perimeter to inspect a static display comprising a Meteor III, Meteor IV, Vampire, Oxford and Harvard and a refuelling Bowser and snowplough. Visits were paid to the G.C.A. unit and to the control tower, from which vantage point the party witnessed synchronized aerobatics by three Meteor IIIs of No. 266 Squadron and a Vampire flown by W/C. T. Balmforth, D.S.O., D.F.C., Wing Commander Flying, Southern Sector. An individual demonstration of the Meteor IV, by S/L. J. N. Mackenzie, D.F.C., followed and a Lincoln bomber flew past. The visitors' tour concluded with an inspection of the station layout and lunch in the officers' mess.

Officers participating in the reception and demonstration were S/L. T. R. Burne, D.S.O., D.F.C., O.C. No. 1 Squadron, S/L. S. H. Troughton-Smith, O.C. No. 222 Squadron, S/L. D. L. Harvey, O.C. No. 266 Squadron, S/L. G. W. Utting, O.C. No. 8 G.C.A. Unit, S/L. E. Drudge, M.B.E., Station Administrative Officer, Tangmere, and S/L. F. A. Hedges, A.F.C., Chief Technical Officer, Tangmere.

***SPITFIRE "AT HOME":** Seen at Eastleigh recently with the last Spitfire but three—a Mark 24—are members of the Empire Test Pilots' School. The Commandant of the School, G/C. S. R. Ubee, A.F.C., stands to the starboard side of the nose with Mr. J. K. Quill, Supermarine Chief Test Pilot. Supermarine personalities include Mr. J. Rasmussen, Chief Liaison Officer, Mr. L. Gooch (Works Manager) and Mr. M. J. Lithgow, test pilot, who lately participated in the deck-landing trials of the Attacker.*